AN INQUIRY

INTO THE

NATURE AND ORIGIN

OF

MENTAL DERANGEMENT.

COMPREHENDING

A CONCISE SYSTEM

OF THE

PHYSIOLOGY AND PATHOLOGY

OF THE

HUMAN MIND.

AND A

HISTORY OF THE PASSIONS AND THEIR EF

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PHYSIC, AND ON CHEMISTRY.

VOLUME I.

LONDON:

PRINTED FOR T. CADELL, JUNIOR, AND W. DAV
IN THE STRAND.

1798.

TO

DAVID PITCAIRN,

M. D. F. R. S. &c.

WHOSE LEARNING AND TALENTS,

SO CONSPICUOUSLY DISPLAYED

IN THE EXERCISE OF HIS PROFESSION,

HAVE DESERVEDLY RAISED HIM TO

GENERAL REPUTATION AND ESTEEM;

AND

WHOSE LIBERALITY AND LOVE OF SCIENCE
POINT HIM OUT AS AN EXAMPLE
WORTHY OF IMITATION;

THIS WORK

IS

RESPECTFULLY INSCRIBED

BY

HIS MUCH OBLIGED FRIEND,

T IE AUTHOR.

PREFACE.

THE work which is at present submitted to the judgment of the public, is an attempt to reduce, under certain fixed principles, a number of loose facts, which abound in the writings of medical men, metaphysicians, and philosophers of different ages and of various countries. Many of these facts have been long known, others, from the late period, and foreign languages in which they have been communicated, it is presumed are only partially so; but although they all relate to

diſorders which are common in civilized nations and are daily becoming more frequent, and are universally lamented, as conſtituting the greateſt calamity to which mankind is ſubject; yet it is generally confeſſed, that the attempts to throw light on their real nature have been very few, and theſe few have not been ſucceſsful.

If we except Dr. ARNOLD, of Leiceſter, no other author of this country has written fully on the ſubject of Mental Diſeaſes. Monſieur DUFOUR is the only author, ſince the time of SAUVAGES, who has written ſyſtematically on them in France; and although the German preſs has ſent forth a vaſt number of publications which relate to diſeaſes of the human mind, yet they are only collections of caſes, hiſtories of individual diſeaſes, or accounts of new remedies; for no author of that learned nation, at leaſt as far as my knowledge of their literature extends,

tends, has written either fully or ſyſtematically on *Veſaniæ*.

Above ſix years ago I firſt formed the deſign of writing a work on the connection of the mind and body, or rather on the influence which they mutually exert on each other; but after having dedicated all the leiſure time I could beſtow to the ſubject for upwards of two years, I diſcovered what indeed mature reflexion might previouſly have convinced me of, that I had engaged myſelf in an almoſt endleſs taſk; for, in order to give it a finiſhed form, it would have been neceſſary to have deſcribed not only all the various changes which the body, both in its healthy and diſeaſed ſtate, undergoes, from the influence of each faculty of the human mind while actively employed, and from the influence of each paſſion; but it would alſo have been neceſſary to have deſcribed the various altered and

morbid phenomena, which are produced in the mind, by the action and re-action of the body, both in health and under disease: this labour appeared to me, then, to be so much the more unnecessary, as I found the subject had been well treated by a foreign writer of great ingenuity and learning: I mean D. JOHN AUGUSTUS UNZER, in a work, entitled *Erste Grunde eines Physiologie der eigentlichen thierischen Naturthierischer Koerper.* Leipzig, 1771.

Although I was, therefore, obliged to give up my plan, I had proceeded too far in this attractive branch of medical science, and had met with so many uninvestigated objects, that I could not quit the field without making other researches; and, accordingly, I directed all the attention I was able to bestow to the morbid phenomena of the human mind.

About the time I am speaking of I received

ceived from Germany, among a number of works which had been recommended to me by my eſteemed and learned friends, Profeſſor BLUMENBACH and Profeſſor ARNEMANN, of the Univerſity of Goettingen, one which greatly intereſted me. It was entitled, *Magazine zum Erfahrungſſeelenkunde;* which means in Engliſh, Magazine of Pſychological Experience. This work conſiſts of no leſs than eight volumes, and was firſt publiſhed in numbers under the direction of two learned Pſychologiſts, CHARLES PHILIP MORITZ and SALOMON MAIMON. In this work I found what I had not yet met with in any other publication, a number of well-authenticated caſes of inſane aberration of mind, narrated in a full and ſatisfactory manner, without a view to any ſyſtem whatever: for the Magazine is almoſt entirely made up of caſes which are ſent to its editors by different hands, and the greateſt part of them are without much

much comment. It is, indeed, to be lamented, that by far the greateſt number of caſes contained in this work are uninteresting to the phyſician. The Germans almoſt equal ourſelves in a fondneſs for what is wonderful; and it muſt be confeſſed, that the Pſychological Magazine contains a rich and ample ſtock of materials with which this frail deſire may be gratified. The hiſtories of prophetic dreams, ſurprizing inſpirations and warnings, occupy too much of this work; and, independently of theſe, the long and often tedious relation of the moral ſentiments of deaf people, the hiſtory of crimes, &c. are for the greater part uninteresting to the phyſician.

The acquiſition of this work, at the very moment that my mind was full of the ſubject, did not fail, as may be eaſily imagined, to give freſh vigour to my ſtudies. I extracted theſe, at firſt, as objects

objects of ſtudy, and many of them will be met with in the work as illuſtrations of particular doctrines or aſſertions.

If I was urged, in the firſt inſtance, to the ſtudy of this obſcure branch of medical ſcience, by a particular bent of mind, and was afterwards excited to proceed in it by the aſſiſtance which was thrown in my way, a ſenſe of duty ſoon joined itſelf to theſe motives, and obliged me to direct my whole attention to it. My ſituation, as a public teacher, rendered it neceſſary that I ſhould ſatisfy myſelf, as to the nature of thoſe things in which I preſumed to inſtruct others. The works which I had peruſed, on the ſubject of inſanity, did not do ſo; and I determined therefore, to make it an object of ſerious thought. How far I have ſucceeded in throwing more light on the nature of mental diſeaſes, than thoſe have done who have preceded me in this path

of knowledge, is not for me to determine. No one who has beſtowed leſs pains on the ſubject than I have done can be ſo fully aware of the imperfections of the work. They who firſt travel into unknown countries ſeldom foreſee all the difficulties they are to encounter; and independently of the difficulties, various other cauſes of ignorance are met with, for, of the various objects with which theſe regions abound, ſome neceſſarily eſcape obſervation, others are often too haſtily examined, and ſome reſiſt examination either from cauſes which are peculiar to their nature, or from want of proper means for inveſtigation. But, in regard to all theſe, it is allowable to indulge the hope, that time and experience will not only rectify whatever is erroneous, but alſo ſupply whatever is defective.

The method which I have adopted, throughout

throughout the whole of this work, is that of Analyſis. This is the genuine touch-ſtone of truth, not only in matters of external ſenſe, but alſo in objects of abſtract reaſon; for, as in conducting this mode of inquiry, every conſtituent or elementary part muſt be ſeparately examined, it is the ſureſt way of detecting error; and as all complex ideas become clear, in proportion as the individual parts of which they are compoſed are diſtinctly repreſented in the mind, ſo it is the beſt mode of eſtabliſhing well founded reſults.

In order to conduct analyſis with ſucceſs, much depends on the previous knowledge of the perſon who conducts it. It is evidently required, that he who undertakes to examine this branch of ſcience in this way, ſhould be acquainted with the human mind in its ſane ſtate; and that he ſhould not only be capable of ab-

ſtracting his own mind from himſelf, and placing it before him, as it were, ſo as to examine it with the freedom, and with the impartiality of a natural hiſtorian; but he alſo ſhould be able to take a calm and clear view of every cauſe which tends to affect the healthy operations of mind, and to trace their effects. He ſhould be able to go back to childhood, and ſee how the mind is modelled by inſtruction. He who cannot do this will never proceed farther in knowledge than what he has acquired by books or by tuition; and how very limited this knowledge is, in regard to the pathology of the human mind, need not be mentioned.

When the work of analyſis is completed, the moſt uſeful and difficult part remains; that of applying the reſult, or general principle, to explain and arrange the individual facts. It is this, indeed, which diſtinguiſhes the man of ſcience

from

from the mere ſcholar. It is, of all mental employments, the moſt difficult, the moſt liable to error, and yet the moſt valuable when well accompliſhed. It is the abridgment of facts and ſimplification of all knowledge. Experience and obſervation teach us a vaſt crowd of facts. We multiply theſe by analyzing them; in analyzing them we generally obtain a knowledge of the cauſes of a number of their properties, and often of the cauſe of their production; and we are thus enabled to reduce a number of effects under a few general principles. Hence the utility of this proceſs. But that it is a proceſs which is often dangerous, and even hurtful to ſcience, muſt alſo be admitted. It is dangerous when we try to reduce general principles under principles ſtill more general, or, as it were, to find out the ultimate ſource of all our knowledge; for where are the facts to guide us in ſuch a reſearch? The ultimate

mate principles are excluded from human research, but, unfortunately, not from human curiosity. It is hurtful to science when a man of genius attempts to reduce the facts of any branch of science under general principles while the facts themselves are too scanty to admit of just conclusions being drawn, for then wild hypotheses must necessarily arise. Let not this observation be construed into an opinion, that hypothesis is useless. There is a period in knowledge when it must be indulged in if we mean to make any progress. It is that period when the facts are too numerous to be recollected without general principles, and yet where the facts are too few to constitute a valid theory. If the exterior form of an edifice is often the principal motive with men for examining its internal structure; so it is in science, that the splendor of an hypothesis, and the desire of proving its solidity, are more frequent motives for research

ſearch than a mere love of knowledge.— But to return to the explanation of my plan.

The objects of my inquiry are the cauſes of inſanity, and the various diſeaſed affections of the human mind, if ſuch an expreſſion can be admitted. The order into which I have arranged theſe, in conſequence of the inveſtigation which has been inſtituted, is founded on the analogy which the cauſes of mental derangement have with each other. I make four claſſes of cauſes. 1ſt. Phyſical or corporeal cauſes; 2dly, Over-exertion of the mental faculties; 3dly, A diſproportionate activity of ſome of the ſaid faculties; and laſtly, The paſſions, or their influence.

From this diviſion of the ſubject ariſes the diviſion of my work. It is divided into three parts or books. In the firſt

I in-

I inquire into the phyſical or corporeal cauſes of delirium and other derangements of mind. In the ſecond, the various morbid changes which each faculty of the human mind is ſubject to, either from an over-ſtraining, or from an original or acquired diſproportionate activity, are inveſtigated; and in the laſt book I treat of the paſſions. The reader muſt excuſe me if I dwell a little longer on this plan, ſince it becomes neceſſary to do ſo, in order to point out the reaſon why certain ſubjects have been treated which, at firſt view, might not ſeem abſolutely neceſſary to the general object of the work.

The phyſical cauſes of delirium, ſuch as the corporeal effects of various exceſſes, exceſſive heat, ſudden tranſitions of temperature, fevers, certain poiſons, &c. neceſſarily act in a phyſical manner on the human frame. They produce morbid

alterations

alterations in the living ſolids, and theſe generally affect the fluids. Some of the cauſes of this claſs operate moſt powerfully on the heart and arteries and abſorbent ſyſtem, others operate with moſt force on the brain and nerves; but, in all caſes, not only ſenſation, but the action of the mental faculties are diſturbed in conſequence of theſe phyſical cauſes. To trace their operation, then, with ſucceſs, it becomes neceſſary to be well acquainted with the general offices and properties of the living ſolids. But as it is probable, that many readers, into whoſe hands this work may fall, are not fully acquainted with theſe ſubjects, I have judged it neceſſary to begin with the doctrines of Irritability and Senſibility, as explanatory of many of the *data* on which much of the reaſoning that follows is founded; and as containing many axioms to which frequent reference is made. This becomes ſo much the more neceſſary, alſo,

as

as I entertain peculiar notions concerning the manner in which corporeal ſenſation is carried on, and as the phenomena of many illuſions, to which our underſtanding is expoſed, are to be accounted for by theſe. The remaining chapters of this book require no comment. They follow each other in a natural order, and lead to a general but conciſe hiſtory of the principal phenomena of delirium, and to the eſtabliſhing of certain fixed notions concerning the immediate or proximate cauſe.

In the ſecond book I ſpeak of the diſeaſes of each faculty of the human mind, and alſo of many kinds of general diſturbance in our intellectual part, which are occaſioned by peculiar faults in the faculties. It is here that I have combined the phyſiology, or natural hiſtory of the mind, with its pathology or morbid hiſtory.

Galen juſtly remarks, "Cujuſque morbi tanta eſt magnitudo quantum a naturali ſtatu recedit, quantum vero recedat, is ſolus novit qui naturalem habitum ad amuſſim tenuerit." This may be ſaid to be particularly true in regard to the diſeaſes of the mind; for, except a ſtudent make himſelf well acquainted with the natural ſtate of each of its faculties, it is impoſſible for him to know either the approach, progreſs, or violence of its diſeaſes; and, as a farther inducement for medical men to pay attention to this ſubject, it may be added, that if they be not well acquainted with the phenomena of mind, both in its natural and diſeaſed ſtate, they will often be ſubjected to much uneaſineſs and anxiety when deſired to give a decided opinion on many caſes of ſuppoſed or real mental derangement: for, not being ſatisfied in their own minds, or rather not knowing how to arrive at a ſatisfac-

tory conclufion, as to the fanity or infanity of certain individuals, they will remain doubtful and will hefitate what to pronounce, and, confequently, will appear in an inferior light to what men, who are fuppofed to be mafters of their profeffion, ought to be defirous of appearing in.

Before I finifh the remarks I have to offer on this book, I ought to acknowledge, that I have endeavoured to condenfe the phyfiological part as much as poffible, but I truft that nothing very effential to the phyfician is omitted.

The third book treats of the paffions. Here I have, perhaps, dwelt too much on the phyfiology of thefe wonderful affections of our moral part. In this I hope to be excufed, not only as very little has hitherto been done, with a view of elucidating their influence on mind and body, but inafmuch as the analyfis of the paffions

paſſions is abſolutely neceſſary to the understanding their peculiar modes of operation.

Such are the motives of my undertaking, and ſuch the plan according to which I have endeavoured to accompliſh it. It remains that I ſhould ſay ſomething of the various works I have conſulted.

Among thoſe which I have peruſed with ſerious attention is that of the learned Dr. ARNOLD. Like the Pſychological Magazine, which I have already mentioned, it contains a ſufficient number of facts to build a ſyſtem on, but I muſt confeſs, that to me Dr. ARNOLD's own arrangement is expoſed to much criticiſm; inaſmuch as it is intirely founded on a gratuitous diſtinction between ideas and notions, and on the apparent variety of theſe which occur in inſanity, rather than on the more immediate nature of

the diſeaſes themſelves. Dr. A. makes but one genus of inſanity; and of this genus he makes ſeveral ſpecies, which he arranges under two diviſions. Mr. LOCK had obſerved, that all our ideas are either obtained by means of our external ſenſes, or by reflexion; and, accordingly, he ſays, all our ideas are either ideas of ſenſation, or ideas of reflexion. Dr. A. chooſes to confine the term *ideas* to the firſt of theſe, and to the ſecond claſs he gives the name of *notions*: and as it appears to him, that in the various ſpecies of inſanity, the diſorder exiſts either in the ideas or in the notions, ſo he reduces theſe ſpecies, as has been already obſerved, under two general diviſions; the firſt he calls *Ideal Inſanity*, the ſecond *Notional Inſanity*. The firſt is characterized by a delirium, ariſing from an error in the ideas of a perſon; the ſecond, by a delirium ariſing from an error in his notions. Of *Ideal Inſanity* he makes the four following ſpecies:

cies: 1ſt. Phrenitic; 2d. Incoherent; 3d. Maniacal; 4th. Senſitive.—Of *Notional Inſanity* he conſtitutes nine ſpecies: 1ſt. Deluſive; 2d. Fanciful; 3d. Whimſical; 4th. Impulſive; 5th. Scheming; 6th. Vain or Self-important; 7th. Hypochondriacal; 8th. Pathetic; 9th. Appetitive.

Before I attempt to point out the errors in judgment to which this arrangement appears to me to give birth, I cannot avoid taking notice of the ſingularity, and very unſcientific nature of ſome of the appellations. One might as well pretend to diſtinguiſh water from all watery fluids, by the name of *aqueous* water, or wine from other liquors by calling it *vinous;* as to pretend to diſtinguiſh one ſpecies of inſanity from another, by calling it *maniacal* inſanity, and another by the name of *phrenitic* inſanity, or a third by the name of *incoherent:* for, ſurely, every maniac is phrenitic, inſane, and incoherent,

herent, if theſe terms are to be taken in the ſenſe in which they are commonly and properly received. The ſame thing may be obſerved in regard to many of the terms by which Dr. A. diſtinguiſhes the various ſpecies of Notional Inſanity.

But I would obſerve, in general, on this grand diviſion of inſanity, that it is not founded in nature, although the Doctor very ſtrenuouſly aſſerts this. It is, in fact, impoſſible to reduce the greater number of caſes of inſanity, which we daily meet with in the courſe of practice, not only under any of the ſpecies which he mentions, but even under the *genera*; for, admitting Dr. A's diſtinction between *ideas* and *notions*, I will venture to aſſert, and indeed we need only look into ſome of the numerous caſes, narrated in his work, for the proof, that one and the ſame inſane perſon ſhall have both erroneous ideas, and erroneous notions, in

in which he firmly believes. The greateſt objection, however, to this diviſion is this, that it tends to create confuſion in the mind, as to the real nature of many of the diſeaſes; thus illuſions, which are certainly very diſtinct kinds of inſanity from mania, are, however, brought under the ſame *genus* with it. Illuſions, however, are only to be conſidered as partial diſeaſes of the human mind, in compariſon with mania, for a perſon who labours under an inſane illuſion may be able to conduct his affairs, and be able to exerciſe his judgment as correctly as moſt men do, except in ſuch matters as have a reference to, or rather aſſociation with the objects of his illuſion. One faculty only of his mind is morbidly affected, and that only at particular times. But, in mania, the judgment is in oppoſition to the conviction of every healthy perſon, in every circumſtance which actuates the patient, and all the faculties of the

the mind are diſordered. But what appears ſtill more ſingular is this; that Dr. A. deſcribes the diſeaſe which almoſt all phyſicians have agreed to call hypochondriaſis, not only as a ſpecies of *ideal inſanity*, which he chooſes to call *ſenſitive inſanity;* but alſo as a ſpecies of *notional inſanity*, which he denominates *hypochondriacal inſanity.* His definition of ſenſitive inſanity is this.—"By ſenſitive inſanity I mean that in "which the diſorder ſhews itſelf chiefly, "or remarkably, in the *erroneous images* "which are excited in the mind, relative to the perſon's own *form, ſubſtance, or other ſenſible qualities or contents;* and which are not only contrary "to truth, but often inconſiſtent with "the nature of things, and almoſt always contradictory to the teſtimony of "thoſe about them." He then proceeds to tell us, that of the patients who labour under this inſanity, ſome imagine them-

themſelves to be wolves, others dogs; ſome lions, cats, cows, cuckoos, nightingales, earthen veſſels, pipkins, jars, teapots, &c. This, however, is the true character of Hypochondriaſis, as will be proved in the body of the preſent work, and certainly is not elucidated by the place in which Dr. A. has arranged it.

The work of M. DUFOURS is more ſcientific than that of Dr. ARNOLD, but it is extremely incomplete in what regards the diſeaſes which diſturb human reaſon. Mr. D. is a man who is, evidently, well acquainted with the mind in its natural ſtate, and indeed the greater part of the work is entirely taken up in pſychological and phyſiological diſquiſition, the only diſeaſes which he deſcribes being idiotiſm, mania, melancholy, and hypochondriaſis. On theſe ſubjects he does not bring forward any thing new.

It

It will be evident to thofe medical readers who have duly ftudied their profeffion, that, in confequence of the analyfis which I have inftituted, many of the difeafes which the celebrated SAUVAGES, and SAGAR have given a place to among the mental difeafes, are not to be confidered as fuch. In the order Hallucinationes, for inftance, I have not admitted any illufions which evidently arife from difeafes of the external fenfes, fuch as the *Suffufio, Diplopia, Syrigmus.* As to the order *Morofitates*, of SAUVAGES, there is hardly any one of the fixteen fpecies which he mentions, which, in my opinion, have any title to be confidered as belonging to the clafs of *Vefaniæ*, if we except *Noftalgia* and *Panaphobia*, which are mere varieties of melancholy. The arrangements of SIR CHARLES LINNE and VOGEL are fubject to more numerous exceptions, which it would be tedious

tedious and unneceſſary to repeat, inaſmuch as the noſological arrangement of theſe authors is generally and juſtly neglected.

Of the authors who, although they have not written expreſsly on the ſubject of mental diſorders, have yet yielded me much aſſiſtance, there is a very long liſt. The moſt uſeful of theſe authors, and their works, I ſhall now enumerate, in caſe others, who chooſe to write on the ſame ſubject, may alſo wiſh to go to the fountain head. Thoſe of our Britiſh Pſychologiſts, ſuch as LOCK, HARTLEY, REID, PRIESTLEY, STEWART, and KAIMS, need not be mentioned. Of foreign authors, the following are thoſe from whom I have derived moſt advantage; UNZER, whoſe work has been already named; FEDER, Profeſſor of Moral Philoſophy in the Univerſity of Gottingen,

Gottingen, whofe excellent work on the Human Will, it is greatly to be lamented, is not tranflated into Englifh. EWALD, on the Human Heart, (*Ueber das Menfchleche Herz;*) an interefting work, which does not appear to be much read even in Germany. SCHMIDT's *Experimental Seelenlehre,* or *Experimental Pfychology;* KRUGER's ditto; MEIER *Ueber die Gemüth bewegungen;* HERZ *Ueber den Schwindel;* WEICKHARD's *Philofophifche Arzt, or Philofophical Phyfician;* CONDILLIC's *Art de Penfer;* TISSOT's Works on the Nerves, and on the Difeafes of Men of Letters.

In regard to the ftyle of this work, I may obferve, that the principal quality I have aimed at has been perfpicuity. This avowal will fufficiently apologize to the candid critic, for the want of elegance which may appear in feveral parts of it. A number of inaccurate expreffions and typo-

typographical errors have escaped my observation; as an apology for which, I can only offer the interruption I have met with, during the printing of the work, from my lectures and other professional avocations, joined to the want of practice in this mechanical part of authorship.

SPRING GARDENS,
Jan. 30, 1798.

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BOOK I.

INQUIRY

INTO

THE PHYSICAL CAUSES

OF

DELIRIUM.

ANALYTICAL INQUIRY, &c.

CHAPTER I.

ON THE PRINCIPLE OF IRRITABILITY AND ITS LAWS.

AMONG modern physiologists, the very celebrated Baron de HALLER is considered as the first who clearly pointed out the existence of this principle in animal bodies, and proved it to be the cause of muscular motion; yet the merit of the discovery undoubtedly belongs to GLYSSON, who wrote a long time before him.

In GLYSSON's work, *On the Stomach and Intestines*, a whole chapter is dedicated to the consideration of this subject. It is entitled *De Irritabilitate Fibræ*. He there establishes

the diſtinction between the principle of irritability and the nervous energy, and aſcribes the action of the heart, and arteries, and the periſtaltic motion of the inteſtines to the influence of the former. "The action of the "heart" he ſays "is neither cauſed nor altered "by ſenſation. The fibres of the heart, by "virtue of the impulſe of the vital blood con-"tained in the ventricles, are repeatedly irri-"tated and exerted to contraction and pul-"ſation, and the irritation being quickly re-"moved, they are relaxed and return to their "natural poſition." In another place, he aſcribes the convulſive motion into which the muſcles of animals are thrown, upon the application of acrid liquors, to this ſubtle influence; he takes notice that the motion of many muſcles continue during ſleep, and after decapitation, when all feeling is aboliſhed, and accounts for the phenomena by ſuppoſing them to be poſſeſſed of irritability. The only thing which renders his doctrine in any degree obſcure, and which has probably given riſe to the commonly received opinion that his ideas on the ſubject were not clear, is an expreſſion which he

he often employs. He makes ufe of the terms *perception* and *perceptible* to denote that property of the mufcles by which they receive the action of a ftimulus, and which we exprefs by the word *irritable*: but he takes much pains to eftablifh an accurate diftinction between the perception of the nerve, of which he alfo fpeaks, and the perception of the irritable fibre, calling the firft *perceptio fenfitiva*, and the other *perceptio naturalis*. See Appendix No. I.

Haller profecuted this fubject much further than Glysson did, and by the force of the facts on which it was founded, the reputation which he himfelf enjoyed, and the refpect paid to his authority, the hypothefis was foon fpread through all the fchools of Europe. But it was not received in all of them with equal readinefs. It was contended that the principle was the fame with that of the nerves, and it was therefore fuppofed that *mufcular action* depended on fenfation. The mufcles it was imagined, *felt* as it were the ftimuli which were applied to them, and it was in confequence of this feeling that they contracted.

Glysson and Haller, and their adherents, were induced to think that there was a *vis insita* in muscles, (irritability): the others contended there was not any *vis insita*, but that muscular motion, as well as feeling, depended entirely on the nervous energy (*vis nervosa*).

It was mentioned as a fact, in favor of this last hypothesis, that muscles were thrown into action equally well when the nerve or nerves leading to these muscles were irritated, as when the stimulus was immediately applied to their own fibres. If it was asked, upon what principle it was to be explained, that the muscles of animals from which the sensorium had been removed by decollation, continued to move for many hours afterwards, as in beheaded frogs, turtles, newtes, &c. it was answered, that in them the nervous power was slowly expended, and that as long as any of it remained in a nerve, so long could the muscles move to which that nerve was sent.

Leaving

Leaving theſe objections to be anſwered by the phenomena of irritability which are immediately to be taken notice of, let it be remarked, that, if in the examination of the queſtion we were to confine our obſervations to the appearances that occur in perfect animals, we ſhould, perhaps, never arrive at the truth, ſince in them nervous and muſcular matter are intimately blended together in the greater number of irritable parts. The fineſt needle when thruſt into any muſcle of a living animal, is acutely felt: how then is it poſſible to determine whether the phenomena which take place in conſequence of the puncture, be owing to a peculiar *vis inſita* inherent in them, or to the nervous energy? But in extending our view to the reſt of the organized world, ſuch a number of facts preſent themſelves as are ſufficient to bring conviction to the mind of any impartial man.

If it can be diſcovered that there are many organized bodies poſſeſſed of a faculty of motion which is totally diſtinct from that produced by mechanical impulſe, or chemical attraction,

traction, inaſmuch as it is only peculiar to them during their living ſtate, and that this motion is excited by the application of ſtimuli; that it follows the ſame laws with animal motion; is augmented by the application of additional ſtimuli, and diminiſhed by withdrawing the ſame, and is evidently affected by the health of the organized body itſelf; and further, if it be proved that theſe bodies, poſſeſſing ſuch motion, have no brain or nerves, or any thing which has a reſemblance to them, then it follows, as a neceſſary deduction, that there is a principle of motion (irritability, or whatever other name may be given it,) diſtinct from nervous energy, and alſo diſtinct from the principle of mechanical motion.

It is among the vegetables, and lower claſs of animals, that the organized bodies alluded to are principally to be found. The ſtamina of the barberry when pricked by a pin, or any other fine ſharp inſtrument, are immediately thrown into evident motion; when the leaves of the *averrhoa carambola* are touched, they draw themſelves together; thoſe of the *mimoſa pudica*,

pudica, or ſenſitive plant, do the ſame thing, either when ſtimulated by the touch, by electricity, or by ammonia. The leaves of the plant called Venus's fly-trap, (Dionæa muſcipula) are beſet on their edges with ſharp prickles: theſe leaves are endowed with a conſiderable portion of irritability, for when an inſect crawls between them they immediately cloſe themſelves, and ſqueeze the little animal to death. Any perſon poſſeſſed of this rare plant may eaſily convince himſelf of its powers; for by irritating the inſide of the leaves with a piece of ſtraw, or graſs, the motion is immediately produced. The moving plant, (*hedyſarum gyrans*) is poſſeſſed of evident motion; it is excited by the ſtimulus of the rays of the ſun: for as ſoon as theſe fall upon it, its leaflets immediately commence their motion, and when the plant is withdrawn from the ſolar light, the motion ceaſes. Many others, beſides theſe already enumerated, are endowed with a faculty of motion in an eminent degree, ſuch as the *oxalis ſenſitiva*, *onoelia ſenſibilis*, the *droſera rotundifolia*, and *longifolia*, &c.

Theſe facts are adduced with the view of eſtabliſhing the truth of what was formerly aſſerted, that there is a faculty of motion diſtinct from that produced by mechanical cauſes, and reſiding in bodies in the ſtructure of which nothing ſimilar to brain or nerves is to be detected. This deduction is further confirmed by the phenomena obſerved in many of the lower tribes of animals, ſuch as hydatids and polyps, in the organization of which nothing ſimilar to nerve is to be found, and which, however, move and contract when ſtimulated.

It may be further remarked, in addition to theſe arguments, that in perfect animals the irritability of a part is never in proportion to its ſenſibility, which, however, might be reaſonably expected if the energy were the ſame in both parts, or, in other words, if muſcular motion was owing to the ſame cauſe as ſenſation. It is a fact eſtabliſhed by repeated obſervations, that the heart has very little ſenſibility, and yet is endowed with an uncommon faculty of motion. I have ſeen the iris wounded ſeveral times in the operation

for

for extracting the cataract, yet I never observed the patient even to wince, or utter any ejaculation expressive of pain. There is not, however, a part of the body possessed of more irritability than this. Although the sensation of a palsied limb be often almost totally abolished, yet the muscles retain their irritability and faculty of motion. In such cases the nerves which go to the muscles, are so diseased or compressed that they do not transmit the impressions of the will, but if a topical stimulus be applied to them, such as a shock of electricity, they are immediately made to contract. The arteries of a paralytic limb also continue to act as usual, notwithstanding the diminution of the nervous influence.

If all these various facts and observations be impartially considered, it will be allowed that it is a fair deduction to conclude that the principle of irritability is distinct in itself from the nervous principle; and when the phenomena of the brain and nerves are explained, this will appear in a still more striking light.

In the human body almoſt all irritable parts are of a muſcular ſtructure, ſuch for inſtance as the heart and arteries, ſtomach and inteſtines, bladder and ureters, &c. and hence it is believed, that no part can be irritable which is not fibrous; and hence another concluſion, that there is a peculiar fibre, *the irritable fibre*, which compoſes the fabric of muſcles. This opinion prevails much at preſent. It is imagined that every irritable part is of a muſcular ſtructure, and many phyſiologiſts go ſo far as to ſpeak of the muſcles of plants, nay ſome aſſert that they have detected them. That all muſcular parts are irritable, I believe to be a fair and juſt concluſion, to which no fact can be oppoſed; but to extend the poſition, and aſſert that all irritable bodies and irritable parts of bodies are muſcular and fibrous, I conſider as an error founded on the narrow baſis of a few facts, but which want the ſupport of various others in order to be confirmed.

There are many of the freſh water polypi, (animals poſſeſſing the faculty of motion in a

very

very remarkable degree,) the ſtructure of which can be eaſily diſcerned by means of a good lens, or microſcope. In them nothing ſimilar to a fibrous texture is to be ſeen. Their tender bodies are formed of a congeries of gelatinous points like boiled ſago, and this is enveloped in a fine membrane. Here, then, there is nothing ſimilar to fibre, and yet there is not an animal more irritable. In the human body itſelf we have two parts (the iris and uterus) remarkable for their irritability, in which nothing ſimilar to muſcular ſtructure is to be diſcovered. We muſt therefore in candour allow that if irritability be connected with any peculiar ſtructure, we are quite ignorant what that peculiar ſtructure is.

The phenomena of irritable bodies, or irritable parts of bodies, are extremely various, and differ according to the purpoſes for which they have been formed. There appear to be certain fixed laws which regulate all theſe phenomena. Theſe laws are general, and therefore common to every irritable body whatever.

The

The very celebrated FONTANA is the firſt, as far as my reading goes, who has attempted to generalize the phenomena of irritable parts. In the firſt volume of his *Fiſica Animale*, a work which it is to be lamented he has not finiſhed, he has reduced them under five general laws, (ſee Appendix, No. 2.) but as his obſervations at the time he wrote, were chiefly directed to animals, he has called them laws of muſcular motion. The ſame ſubject has of late been ſtill more generalized by an ingenious gentleman, Dr. GIRTANNER, who in an excellent eſſay, publiſhed in the *Journal de Phyſique*, for 1790, has clearly ſhewn the analogy between the irritability of the vegetable and the animal kingdom, and by modifying the axioms of FONTANA, has made them applicable to the phenomena of the motions of all organized bodies whatever. In this eſſay he has gone a ſtep farther, for he has attempted to eſtabliſh a theory concerning the nature of irritability. This theory will be examined in its proper place. The laws of irritability which follow are partly new axioms, partly modifications of thoſe of FONTANA and GIRTANNER.

AXIOM I.

AXIOM I. *After every action in an irritable part, a ſtate of reſt, or ceſſation from motion, muſt take place before the irritable part can be again incited to action.*

If, by an effort of volition, we throw any of our muſcles into action, that action can only be continued for a certain ſpace of time; the muſcle becomes relaxed, notwithſtanding all our endeavours to the contrary, and remains a certain time in that relaxed ſtate before it can be again thrown into action. After every contraction of an artery a relaxation follows, although the ſtimulus which incites it to action (the blood) be conſtantly applied to its internal ſurface. After every contraction of the muſcular coat of the ſtomach, or of the inteſtines, the ſame event takes place.

In the vegetable kingdom we find the irritability regulated by the ſame law. Although the rays of the ſun conſtantly act for ſome hours on the leaves of the *hedyſarum gyrans*, yet their motions are always interrupted by ſhort ſtates of reſt.

AXIOM II.

Axiom II. *Each irritable part has a certain portion or quantity of the principle of irritability, which is natural to it, part of which it loſes during action, or from the application of ſtimuli.*

Axiom III. *By a proceſs wholly unknown to us it regains this loſt quantity during its repoſe, or ſtate of reſt.*

In order to expreſs the different quantities of irritability in any part, we ſay that it is either more or leſs redundant, or more or leſs defective. It becomes redundant in a part when the ſtimuli which are calculated to act on that part are withdrawn, or withheld for a certain length of time, becauſe then no action can take place; while on the other hand the application of ſtimuli cauſes it to be exhauſted, or to be deficient, not only by exciting action, but by ſome ſecret influence, the nature of which has not yet been detected; for it is a circumſtance extremely deſerving of attention, that an irritable part, or body, may be ſuddenly deprived of its irritability by powerful ſtimuli, and yet no apparent increaſe of muſcular or vaſcular action take place at the time. A certain

tain quantity of ſpirits taken at once into the ſtomach, kills almoſt as inſtantaneouſly as lightning does: the ſame thing may be obſerved of ſome poiſons, as opium. If a large doſe of diſtilled laurel water be given to an animal, it inſtantly deprives the whole muſcular parts, and indeed the whole frame, of its irritability; it deſtroys life without any previous evident increaſed action of the heart and arterial ſyſtem. There is another poiſon of the vegetable kind, the fatal influence of which is almoſt as quick as that of lightning, and which ſuddenly exhauſts the whole irritability of the ſyſtem, without producing any evident violent action in the heart and arteries, or other irritable parts of the animal. It is the juice of the *cerbera ahovai*, a poiſon with which the South Americans impregnate their arrows. But in order that it may produce its deleterious effects, it muſt be applied to a wound. The ſlighteſt puncture is ſufficient for the purpoſe. My very ingenious and eſteemed friend, Profeſſor Blumenbach, of the univerſity of Göttingen, related to me the following experiment, which he made with this poiſon. He took

took a young puppy, and having ſlightly ſcratched the tip of its ear with a needle, he applied to the wounded part a little of the dried juice of the cerbera ahovai, which he ſcraped from an arrow. Scarcely had he time to lay the little animal on the ground when it was ſeized with a convulſion, and inſtantly died. The muſcles were quite flabby after death, and the blood did not coagulate.

A vaſt variety of natural and diſeaſed actions of irritable bodies are explained by the application of the ſecond and third laws of irritability. The celebrated SENAC, and Profeſſor WEITBRECHT, of Goettingen, were of opinion that all muſcular motion depended on the vis nervoſa of theſe parts, and not on any diſtinct principle, any vis inſita in them. They objected to HALLER's explanation of the phenomena of circulation by the doctrine of irritability, that if the heart contracted ſolely from the ſtimulus of the blood, it ought always to be in a ſtate of contraction; for they proved by experiment that the auricles and ventricles of the heart were never completely empty.

Or

Or if it did not always contract, it ought at leaſt to have done ſo before the cavities were half filled, ſince there was preſent a ſufficient ſtimulus to act on the whole internal ſurface. This objection ſeems to have occaſioned conſiderable embarraſſment to HALLER, for he never anſwered it in a ſatisfactory manner. Profeſſor WHYTT, of Edinburgh, although of a contrary opinion to HALLER, inaſmuch as he conſidered the motion of the heart to proceed from an irritation of its nerves, and not from any affection of a *vis inſita*, yet as he imagined the objection militated equally againſt his doctrine, anſwered it by ſaying that a certain degree of diſtention was neceſſary to produce the irritation of the nerves, and that until this degree of diſtention took place, no motion could enſue. If this were to be admitted as a principle, it muſt hold good in every analogous caſe. But we know from the obſervations of FONTANA, that in eels, turtles, ſnails, and ſome other animals, the heart remains completely diſtended with blood for ſome ſeconds before it contracts. If diſtention, therefore, were the only circumſtance which produces the motion of the heart,

here would be a caufe operating without an effect, and under circumftances favourable for fuch an event.

The way in which the difficulty is at prefent explained, is by fuppofing, that a portion of the irritability of the heart is exhaufted by each action, and that a certain ftate of quiefcence is neceffary before that principle can be again accumulated in the part, in fufficient quantity to be acted on. This ftate of reft in the heart and arteries is the interval between the pulfations, and in thefe organs is only of a few feconds duration.

There is a confiderable limitation to this law; for if an irritable part be kept too long in a ftate of inaction, or if its habitual ftimuli be too long withheld from it, it lofes its irritability, or, to fpeak more correctly, it ceafes to form any. This will be explained more fully afterwards.

Axiom IV. *Each irritable part has ftimuli which are peculiar to it; and which are intended to fupport its natural action.*

The

The greater number of animals both cold and warm blooded, are to be confidered under two points of view, in regard to the prefent fubject.

1. Each irritable part of an animal, fuch as its heart, ftomach, gall-bladder, arteries, abforbents, mufcles, &c. is to be confidered as a diftinct irritable body, having a fufceptibility of being acted on by certain ftimuli, which in thefe parts preferve a healthy action, but which if applied to others would produce an irregular one, and confequent difeafe; thus the blood is the natural ftimulus to the heart, arteries, and veins; but if this fluid by any accident gets into the ftomach, it produces ficknefs and vomiting, acting as a powerful ftimulus to that vifcus. If the gall, which is the natural ftimulus to the gall-bladder, ducts, and duodenum, is by any accident effufed into the cavity of the peritoneum, it excites too great action in the veffels of that part, and induces inflammation. The urine does not irritate the tender fabric of the kidneys, ureters, or bladder, except in fuch a degree as to pre-

 ferve

ſerve their healthy action; but if it be effuſed into the cellular membrane, it brings on ſuch violent action of the veſſels of theſe parts as to produce gangrene. Such ſtimuli are called *habitual ſtimuli* of parts.

2. All the irritable parts of animals are to be conſidered as forming one general ſyſtem, connected by a particular contrivance, by means of which the influence of certain ſtimuli, although only local in their application, is diffuſed throughout the whole body. The connecting medium alluded to is the brain and nervous ſyſtem. There is no irritable part of the human body whatever, into the ſtructure of which ſome fibres of nerves do not enter, and by their means, therefore, various impreſſions are tranſmitted to them from diſtant places; thus the impreſſions of various deſires cauſe the whole muſcular ſyſtem to be increaſed in action. Heat, although only applied to the ſkin, does the ſame thing; wine or ſpirits in moderate quantity, although only applied to the ſtomach, do the ſame thing alſo.

AXIOM V.

AXIOM V. *Each irritable part differs from the reſt in regard to the quantity of irritability which it poſſeſſes.*

This law explains to us the reaſon of that great diverſity which we obſerve in the action of various irritable parts; thus the muſcles of voluntary motion can remain a long time in a ſtate of action, and if it be continued as long as poſſible, another conſiderable portion of time is required before they regain the irritability they loſt; but the heart and arteries have a ſhort and ſudden action, and their ſtate of quieſcence or reſt is equally ſo; the circular muſcles of the inteſtines have alſo a quick action and ſhort reſt. The urinary bladder does not fully regain the irritability it loſes, during its contraction, for a conſiderable ſpace of time; the veſſels which ſeparate and throw out the menſtrual diſcharge, act in general for three or four days, and do not regain the irritability they loſe for a lunar month.

AXIOM VI. *All ſtimuli produce action in proportion to their irritating powers.*

All

All our varieties of food, from the ſimpleſt and mildeſt vegetables, to the moſt compound aromatic diſhes, all our drinks, from water to the ſtrongeſt ſpirits, all gradation of heat, from the cold of the poles to the ſcorching rays of a tropical ſun, are regulated by this law in their primary action, not only on the human, but alſo on every body poſſeſſed of irritability.

As a perſon approaches his hand to the fire the action of all the veſſels of the ſkin is increaſed, and it glows with heat; if the hand be approached ſtill nearer, the action is increaſed to ſuch an unuſual degree as to occaſion redneſs and pain; and if it be continued too long, real inflammation takes place; but if this heat be continued, the part at laſt loſes its irritability, and a ſphacelus, or gangrene enſues.

When an animal which is capable of ſuſtaining great extremes of heat and cold, is obſerved with attention, it will be found that the quickneſs of circulation is always proportioned

tioned to the degree of heat. The heart of hamſter beats 100 in a minute during the heats of ſummer: in winter it beats only 15 in a minute. See *Verſuch einer natürlichen Geſchichte des Hamſters durch* F. G. Sulzer. *Göttingen und Gotha*, 1774.

Axiom VII. *The action of every ſtimulus is in an inverſe ratio to the frequency of its application.*

In applying this law in its utmoſt extent to the explanation of certain phenomena in irritable bodies, it muſt be recollected that each irritable part has a quantity of the principle of irritability natural to it; and it is alſo to be obſerved, that many parts loſe their irritability much more quickly than others.

This law, then, explains ſeveral phenomena, remarkable in particular habits, which attend the uſe of ſtimuli. A ſmall quantity of ſpirits taken into the ſtomach increaſes the action of its muſcular coat, and alſo of its various veſſels, ſo that digeſtion is thereby facilitated. If the ſame quantity, however, be taken frequently,

quently, it loſes its effect. In order to produce the ſame effects as at firſt, a larger quantity is neceſſary, and hence the origin of dram drinking. A ſmall portion of tobacco when firſt taken into the mouth, ſtimulates the duct of the parotid gland, and alſo the gland itſelf, increaſing the flow of ſaliva; but if this quantity be daily chewed, it gradually loſes its effects, and large mouthfuls muſt be taken. The ſame theory holds good with regard to various medicines of the tonic and ſtimulant kind, which it would be entirely out of place at preſent to mention.

AXIOM VIII. *The more the irritability of a part is accumulated, the more that part is diſpoſed to be acted upon.*

It is on this account that the activity of all animals, while in perfect health, is much livelier in the morning than at any other time of the day; for during the night the irritability of the whole frame, and eſpecially that of the muſcles deſtined for labour, viz. the muſcles of voluntary action, is re-accumulated. The

ſame

ſame law explains why digeſtion goes on more rapidly the firſt hour after food is ſwallowed, than at any other time, and it alſo accounts for the great danger that accrues to a famiſhed perſon upon firſt taking in food.

The general effects of all food are principally to be conſidered,

1. As topical ſtimuli to the ſtomach and inteſtines.

2. As general ſtimuli, acting through the medium of the nerves.

3. As materials repairing the waſte which is conſtantly taking place in that ſtimulus (the blood) which ſupports the action of the heart and arteries.

The food is the ſtimulus therefore which excites the healthy action of the muſcular coat of the ſtomach and inteſtines, the action of the veſſels which ſecrete the gaſtric fluid, and which

which keeps up the action indirectly of the whole fanguiferous fyftem.

When food is withdrawn it is evident that the action of all thefe parts muft be diminifhed, and the irritability of courfe accumulated efpecially in the fanguiferous fyftem. If, therefore, a perfon who has fuftained hunger for a great length of time eats incautioufly, and fwallows quickly, it has the fame effect upon him as the drinking too large a quantity of fpirits has on a perfon who has not been accuftomed to take them except in a moderate quantity, that is, it rapidly exhaufts the irritability of his frame; and hence we have many inftances on record of people dying from fuch an imprudent conduct. In the fecond volume of the Memoirs of the Philofophical Society of Manchefter, there is a cafe related which is highly illuftrative of this fact. The circumftances are fhortly thefe. Part of a coal pit fell in, and one of the colliers was thereby confined in one of the galleries of the mine. His companions did not difcover him till the eighth day after the accident. When they reached

reached him he was lying on his belly, in a cavity which he had been digging. He was ſtill alive, and addreſſed one of his companions by name, and aſked for ſomething to drink. That which was given him was exactly the moſt proper thing which could have been thought of, a little gruel every ten or fifteen minutes. It was not until the following day that they got him home, as they were obliged to dig a paſſage for his conveyance; as ſoon as he got home he was put to bed, covered, and fed with chicken broth, ſoon after which his pulſe began to grow quick, and he expired without a ſtruggle.—Such are the circumſtances of the caſe. It appears probable that in this caſe the external heat did the moſt injury. If he had continued a day or two longer in the mine, or had not been brought into a warm room and warm bed, there is reaſon to believe he might have recovered, for it is evident that he was doing well during the whole of the firſt day that his companions diſcovered him.

A medical

A medical gentleman, a friend of mine, who had been afflicted with various dyſpeptic complaints, and imagined they were to be remedied by abſtemious living, accuſtomed himſelf for ſome time to eat only ſuch diet as afforded little nouriſhment, and which was eaſily digeſted, ſuch as gruel, boiled rice, &c. By this means his organs of digeſtion ſeemed to recover their former ſtrength, his dyſpeptic ſymptoms diſappeared, and he now deemed it unneceſſary to continue any longer in the ſame rigid plan. Accordingly he returned to his former way of living, but after the firſt full meal he took, he was ſeized with an inflammation of the bowels.

If one of the natural ſtimuli which keeps up the circulation of the blood in a vaſcular part be diminiſhed, the irritability of that part is accumulated, and diſpoſes the veſſels to exceſſive action; and hence chilblains, ophthalmias, and inflamed tonſils, are extremely common at thoſe ſeaſons of the year when tranſitions from cold to heat are moſt frequent, or when people come from a cold atmoſphere into warm rooms.

It may be remarked that almoſt all the caſes of inflammation of the lungs or ſtomach to which the common people of London are ſubject, ariſe from ſimilar cauſes. Either they have been riding in carts, or on the tops of coaches, in very cold weather, and afterwards have come into a warm room, probably an alehouſe; or elſe they have been working for hours in drains, or in ſimilar cold ſituations. While they remain in the cold, no ſymptoms of the diſorder occur. It almoſt always commences when they get home.

If external heat be ſo much diminiſhed as to cauſe the circulation of blood in a part to be almoſt totally ſtopt, great danger will ariſe if the part be then ſuddenly expoſed to too warm a temperature, for ſuch a degree of inflammation occurs in theſe inſtances, as cauſes a gangrene to enſue. Hence the beſt cure for a froſt-bitten part is the common application of melting ſnow, or cold water. Similar facts to theſe are to be diſcovered in the vegetable kingdom: a plant that has been reared in a very poor ſoil is like a perſon half famiſhed.

If

If it be immediately tranſplanted into a richer ſoil it ſoon dies. A plant that has been reared in a cold temperature if brought into a hot-houſe, or very warm apartment, grows rapidly for a ſhort while, but ſoon dies.

AXIOM IX. *If the ſtimuli which keep up the action of any irritable body be withdrawn for too great a length of time, that proceſs on which the formation of the principle depends is gradually diminiſhed, and at laſt intirely deſtroyed.*

In the comment on the third axiom, which expreſſes that a certain degree of quieſcence from action is neceſſary to repair the irritability, it was mentioned that the axiom was to be underſtood as being true only under certain limitations. The principle of irritability is not to be conſidered as a mere quality, but as a fine ſubtle kind of matter, ſecreted from certain veſſels; or if not ſecreted, at leaſt formed by ſome occult action of living bodies. It is evident that it depends on the circulation of the blood; for its formation, *cæteris paribus*, is more or leſs quick as the animal is more or

or lefs vigorous. Not only the healthy action of the heart and arteries, but a certain proportion and texture of the blood itfelf, is neceffary to its formation. Whatever diminifhes the healthy action of the vafcular fyftem, and the due quantity of fluids, muft neceffarily prevent the formation of a proper quantity of this principle. But all general ftimuli operate directly or indirectly, either in caufing a proper fupply of chyle and blood, or in preferving the action of the heart and arteries; and therefore the diminution of thefe, or the total abftraction of them, may occafion either a direct debility, or death itfelf. When the irritability of the fyftem is too quickly exhaufted by heat, as is the cafe in certain warm climates, the application of cold invigorates the frame, becaufe cold is a mere diminution of the overplus of that ftimulus which was caufing the rapid confumption of the principle. Under fuch or fimilar circumftances, therefore, cold is a tonic remedy, but if in a climate naturally cold, a perfon were to go into a cold bath, and not foon return into the warmer atmofphere, it would

would deftroy life juft in the fame manner as many poor people who have no comfortable dwellings are often deftroyed from being too long expofed to the cold in winter. Upon the firft application of cold the irritability is accumulated, and the vafcular fyftem therefore is difpofed to great action; but after a certain time, all action is fo much diminifhed that the procefs, whatever it be, on which the formation of the irritable principle depends, is entirely loft. When a perfon, after having ate a full meal, fafts for feveral hours, he is thereby difpofed for every healthy action; for there is then a fufficient quantity of materials yielded to the fyftem to repair its wafte, and the temporary abftinence from food, as it allows the irritability to be accumulated, caufes the augmented volume of blood to act more powerfully than it would do were the irritability exhaufted by any general ftimulus applied to the ftomach. Drinkers of fpirits, and the inhabitants of warm climates, are generally emaciated and weak; for independently of other caufes, the irritability which ought to be expended in forming good chyle, and good blood, and in difpofing of thefe materials,

materials, is waſted by ſuch exceſſive ſtimuli. Hence, alſo, thoſe who eat too frequently, and too much, are liable to various diſorders, and debility; ſuch as a faulty ſecretion of gaſtric fluid, a faulty action of the muſcular coat of the ſtomach, generation of air in the ſtomach, faulty ſecretion of pancreatic liquor, faulty ſecretion of bile, enlargement of the liver, of the meſenteric glands, palſy, &c. When theſe primary affections continue long, they produce various others ſympathetically, ſuch as headach, vertigo, apoplexy, &c.

Debility and death, then, may be produced by the too frequent uſe of ſtimulants, or by taking at once too large a quantity of any powerful one. To debility thus occaſioned, a late eccentric genius in medicine (Dr. JOHN BROWN) gave the name of *indirect debility*, and from a want of enlarged views on the ſubject of his profeſſion, he generalized his ideas of direct and indirect debility ſo far as to make them the principles of explaining, according to his notions, not only the origin and nature of all diſeaſes, but alſo the action of all medicines. The doctrine of direct and

indirect debility is doubtless true to a certain extent, and explains many phenomena of diseases; it has also modified and ameliorated practice in several points; but to make it the basis of a general classification of disorders, to attempt to explain all their phenomena by it, and above all, to make it the only foundation of the indications of cure, betrays a singular incapacity for comprehensive observation, and a radical defect of medical science.

The general laws agreeable to which irritability seems to be regulated in producing its various phenomena, having been described, a question of great intricacy now arises for discussion: What is the nature of this principle?

Until of late no opinion whatever was offered on this subject, except by those who considered irritability and the nervous principle as one and the same thing. Many conjectures have been formed concerning the nature of this last mentioned influence. Some have thought it to be electricity; others the magnetic fluid; others what they call æther; others

others a fluid *fui generis*. As the examination of thefe hypothefes belongs to the fubject of Senfation, it will be more agreeable to method to defer it until that fubject is itfelf inveftigated.

Of late a new doctrine has arifen, which has been dignified with the refpectable title of a theory. The proofs of its truth, however, are fo fcanty, and fo many facts remain unexplained by it, that it cannot be allowed fuch an honour. Dr. GIRTANNER is the firft who confiders irritability to be nothing elfe than oxygene; the bafis of pure air. This opinion has been adopted by Dr. BEDDOES, and a few other pneumatic doctors.

In examining this hypothefis, it is impoffible for any one who has a juft fenfe of the value of candour in another, not to be hurt by the manner in which Dr. GIRTANNER conceals difcoveries that have been made, and conjectures that have been offered to the public long before he wrote. There is a fpecies of egotifm in fome authors which is fo powerful as to make them hide not only the fources from which

they borrow their ideas, but often to ascribe to themselves the merit of discoveries to which they have no kind of claim. The opinions of their opponents, when easily combated, are all brought forward, because the refutation of these adds to their glory; but the combats of others who have fought successfully before them in the same field are not mentioned, for fear that their fame should suffer diminution. Such a conduct must necessarily occasion disgust, a sentiment always unfavourable to a writer, however great his talents may be, for it prevents our doing him that justice to which he is otherwise justly entitled.

" I think" says Dr. G. " that the oxygene " is absorbed by the blood, and that the " venous blood is oxygenated in the lungs " during respiration. The most celebrated " naturalists, and chemists, are of a different " opinion; they think that the oxygene does " not combine with the venous blood. Ac- " cording to them, this last loses carbon and " hydrogene, and recovers the bright colour " natural to it, without absorbing any thing " from the atmosphere."

In

In another part he ſays, " After having a " long time attended to the phenomena of " reſpiration, and made many experiments " upon this ſubject, I think it may be con" cluded, that during reſpiration one part of " the oxygene of the vital air combines with " the venous blood, of which it changes the " black colour, and makes it vermilion."

Theſe concluſions had been made by Dr. GODWIN, in his theſes *on reſpiration*, a conſiderable time before Dr. GIRTANNER wrote. He mentions many beautiful experiments, by which the opinion is proved to be true.

The conjecture that oxygene is the principle of irritability, is peculiar to Dr. GIRTANNER. Whether it be true or falſe, he has the merit of having firſt mentioned it.

Before any remarks be offered on this *theory*, as Dr. G. calls it (*a*), it appears but juſt to place

(*a*) Among medical ſtudents, nothing is more common than to apply the word theory to every idle ſpeculation which

place it in the moſt favourable light, and to bring forward the proofs on which it is founded; and as no perſon will probably ever do this more advantageouſly than the author himſelf, his own expreſſions are adopted. "The irritability of organized bodies is al-

which preſents itſelf to their fancy; but it is a lamentable circumſtance to ſee a gentleman well verſed in literature and in ſcience, and who writes an elegant and perſpicuous language, abuſe abſtract terms ſo very egregiouſly.

As this work is chiefly intended for the younger part of medical men, and as the diſtinction between theory and hypotheſis may not be familiar to them, it may be remarked, that the former term ought only to be applied to ſuch a ſyſtem of general rules as is intirely founded on experience, and which explains every phenomenon belonging to that branch of ſcience to which it refers. An hypotheſis, on the other hand, is a ſyſtem of general rules, founded partly on fact, partly on conjecture. A theory explains every fact; an hypotheſis explains only a certain number of facts, leaving ſome unaccounted for, and others in oppoſition to it. There is not, either in medicine or chemiſtry, even in their improved ſtate, any ſyſtem of general rules, or principles, which is intitled to the denomination of theory. Doubt always precedes truth: hypotheſis prepares the way for theory;—hence the utility of this laſt in ſcience.

"ways

" ways in a direct ratio of the quantity of
" oxygene they contain."

1. " Every thing that increafes the quantity " of oxygene in organized bodies, increafes at " the fame time their irritability."

" We have feen a direct proof of this in the " 3d experiment cited above. Befides this, a " great number of other phenomena fupport my " opinion. The irritability of animals made to " breathe oxygene air is wonderfully increafed. " Blanched plants, whofe irritability has been " accumulated in confequence of the abftraction " of the ftimulus of light, contain a great quan- " tity of oxygene, according to the experiments " of Mr. Fourcroy. I have obferved in the " courfe of my experiments, that plants made to " grow in oxygene air became white, although " expofed to the light. But what fhews more " clearly than all, that the irritability is in pro- " portion to the quantity of oxygene, are the " phenomena attending the action of mercury " and mercurial falts upon animals. As this is " one of the moft ftriking proofs of my theory,

" and

" and as I have before obſerved, that many per-
" ſons, and among the reſt, philoſophers of the
" firſt rank, ſuch as Dr. CRAWFORD, have been
" ſtruck with the novelty and ſimplicity of my
" mode of explaining theſe phenomena, I can-
" not forbear entering into ſome detail upon this
" ſubject. It is a well known fact among phy-
" ſicians, that mercury, in its metallic ſtate, has
" no effect on the human body. I have known
" many people who for many years took a daily
" portion of quickſilver, to the amount of one
" or two ounces, from an idea of guarding
" themſelves from epidemic diſeaſes, but who
" never perceived any effect whatever from this
" ſingular cuſtom. It is proved by Dr. SAUN-
" DERS, that the effects of mercurial ointment
" are owing only to the ſmall quantity of mer-
" cury that has been oxidated during a long tri-
" turation. It is neceſſary, therefore, that mer-
" cury ſhould be oxidated to have any effect
" upon the human body. On the other hand it
" is well known that in perſons who have taken
" the oxide of mercury, the mercury after
" having produced its uſual effects, has paſſed
" through the ſkin in a metallic form, and has
" amalgamated

"amalgamated itſelf with watches, and the gold "in the pocket, &c. The oxide of mercury in "paſſing through the human body, parts with "its oxygene, and it is to this oxygene alone, "which remains combined with the ſyſtem that "the effect produced by oxidated mercury is "owing. This effect is the mercurial diſeaſe, "the ſymptoms of which are the ſame as thoſe "of the ſcurvy; the mouth, gums, and the "whole ſyſtem are affected in a manner ex-"tremely analogous. But the ſcurvy, as I have "proved in my firſt eſſay, is a diſeaſe produced "by the accumulation of the irritable prin-"ciple. The accumulation, therefore, of the "oxygene producing the ſame effects, the great "analogy between the irritable principle and "oxygene appears to be proved; and I think "myſelf authorized to conclude that oxygene "is the principle of irritability."

In the above citation, Dr. GIRTANNER's opinion is clearly ſtated, and the chief arguments on which it is founded are mentioned. The force of the concluſion is chiefly ſupported by the idea that the ſcurvy is a diſeaſe of accu-

mulated

mulated irritability, or in other words, a diſeaſe in which the body is too highly oxygenated; for it is owing to the great analogy which Dr. G. thinks he diſcovers between ſcurvy and the effects of mercury, that he concludes that the mercurial diſeaſe is alſo a diſeaſe of ſuper-oxygenation.

As I mean to contend with Dr. Beddoes that ſcurvy, ſo far from being a diſeaſe of ſuper-oxygenation, is one in which the blood is not ſufficiently oxygenated, it may be thought right to adduce, in the firſt place, thoſe circumſtances which Dr. G. conſiders as proofs in favour of his opinion.

"By the abſtraction of many of the common ſtimuli, for any length of time, the irritability of the fibre accumulates ſo much, that the moſt trifling ſtimulus produces the moſt violent effects, and frequently, even inſtantaneous death. This diſeaſe is called the ſcurvy, concerning the nature of which, medical men have formed ſo many falſe and ridiculous theories. It is of the utmoſt im-

"portance

"portance to mankind to know the true nature "of the diseafe; fince, in confequence of our "ignorance in this particular, we have been "unable to find a fure remedy for it, and fo "many thoufands of lives have fallen a facri-"fice to its ravages, in armies, fleets, and "befieged towns.. In the laft war the Englifh "fleet fuffered dreadfully from the fcurvy: "and laft year a great number of foldiers died "of this difeafe in the Imperial army in "Wallachia, in confequence of the abftraction "of nutriment (the emperor having ordered "that a kind of pafte, made of bread and "water, fhould be given to the foldiers inftead "of meat) of the ftimulus of oxygene, in the "corrupted atmofphere of the fens of Walla-"chia, and laftly, of the nervous ftimulus, "the moft powerful of all; for the greateft "part of the army were engaged by force, "and againft their will.

"The abftraction of all thefe ftimuli accu-"mulated the irritability of the fibre, and "caufed the fcurvy, and that dreadful mor-"tality that took place in the army." See the

the tranflation of GIRTANNER's Effay in BEDDOES' work on Calculus)

To reafon thus on the nature of a difeafe, from a preconceived notion concerning the manner in which its remote caufes produce their effects, is by no means uncommon in the annals of medicine, although certainly not agreeable to the fpirit of philofophical inquiry. If the phenomena of the difeafe itfelf, inftead of being accounted for by fuch an hypothefis, ftand in direct contradiction to it, and the mode of cure be found to confift in exhibiting remedies which abound with the very materials which are fuppofed to produce the diforder; thefe are fufficient arguments to invalidate the opinion.

The principal external phenomena of fcurvy are a dark coloured blood, and purple, blue, and violaceous coloured fpots on the fkin, dark coloured, tumid, and fpongy gums, a fœtid breath, and fœtid excrements; and a great tendency to gangrene. But it has been proved that oxygene reddens the blood, giving it the carnation

carnation tint which we obſerve it have in the arteries of healthy people. If ſcurvy, therefore, conſiſted in a ſuper-oxygenation of that fluid, why are not the uſual effects of ſuch a ſtate to be diſcovered?

It is now a well aſcertained fact, that of all remedies which have been tried for the cure of this diſeaſe, none ſucceed ſo well as aceſcent vegetables, and the vegetable and mineral acids; but theſe contain vaſt quantities of oxygene, which they eaſily part with in the human body, and which, therefore, ought to do harm, were ſcurvy owing to too much oxygene in the ſyſtem. Did any one ever hear of ſcurvy being cured by alkalies, by ſpirits, or any medicines which do not contain oxygene? Is not animal fleſh alone incapable of curing the diſeaſe, although undoubtedly it is in itſelf a more powerful ſtimulus than vegetable food, and which, in a malady ariſing from an abſtraction of ſtimuli, might therefore be ſuppoſed to do good?——Theſe arguments tend to prove that the baſis of Dr.

GIRTANNER'S

GIRTANNER's reaſoning is faulty. It may appear, nevertheleſs, to many, that oxygene is probably the principle on which the irritability of bodies depends. This ſeems to be Dr. BEDDOES' opinion, as well as Dr. GIRTANNER's, and he makes it a ground of argument in ſupport of his aerial method of treating phthiſis. The ſucceſs of his practice will certainly not be adduced in ſupport of the opinion, ſince it may be ſafely aſſerted that there is hardly any other treatment which has been extolled for the cure of this melancholy diſorder which has not ſhewn powers equal, if not ſuperior, to thoſe exhibited by breathing an atmoſphere of a reduced ſtandard.

But to confine our arguments to the hypotheſis itſelf, it is to be remarked, that all ſubſtances which are known to ſtimulate are ſuppoſed to act by withdrawing the oxygene from an irritable body, by means of a ſuperior degree of chemical affinity which they have for that ſubtle element.

Dr. GIRTANNER reduces all bodies which come in contact with the "*irritable fibre*" under three claſſes.

"*The firſt* comprehends thoſe which have "the ſame degree of affinity to the irritable "principle, or oxygene, as the organized "fibre itſelf. Theſe ſubſtances produce no "effect on the fibre.

"*The ſecond* contains thoſe which have a "leſs degree of affinity to the oxygene than "the fibre has. Theſe ſubſtances, coming "in contact with the fibre, will ſurcharge it "with oxygene, and produce the ſtate of ac-"cumulation. Theſe ſubſtances may be called "negative ſtimuli.

"*The third* claſs contains thoſe ſubſtances "which have a greater degree of affinity to the "oxygene than the fibre itſelf has. Theſe, "coming in contact with the fibre, will de-"prive it of its oxygene, and produce the "ſtate of exhauſtion. I ſhall call theſe poſi-"tive ſtimuli."

In regard to this theory (as it is called) I have to obſerve in the firſt place, that the whole phenomena of mechanical and mental ſtimuli on the irritable parts of animals are not only left unexplained, but really ſtand in direct contradiction to it. Does a piece of rock cryſtal, a particle of ſand, a thorn, or the point of a pin, all of which ſtimulate, draw oxygene from a muſcle? Can any proof whatever be given of their having ſuffered any chemical change upon being applied to an irritable part? Yet they are all of them capable of exciting inflammation when applied to naked veſſels, or muſcles. The ſame queſtions may be aſked concerning our thoughts, conſidered as ſtimuli. We choose to walk, and accordingly we get up and walk. In what manner can the oxygene in our limbs be affected by ſimple volition? The brain muſt be ſuppoſed to be a chemical laboratory, and the ſoul an operative chemiſt who prepares agents which have a more powerful attraction for oxygene, than the muſcular fibre. Theſe, it is to be imagined, are ſent along the nerves quickly or ſlowly, in large or ſmall doſes, according as a man

a man chooſes to dance, or to walk, to lift a load, or to lift a feather.

It is a curious circumſtance in regard to this theory, that oxygene is conſidered, not only as the principle of irritability, but alſo as the agent that acts on it. Dr. G. indeed, denies this, and ſays that oxygene, and bodies which contain it in great abundance, are only negative ſtimuli, that is, they yield it to the muſcular parts, and prediſpoſe them to greater action. Cold, which is a negative ſtimulus, and hunger, if too long continued, gradually deſtroy life itſelf, in the way in which all negative ſtimuli are ſuppoſed to produce their effect, that is, by not ſupporting action. If bodies which yield oxygene are to be conſidered as negative ſtimuli, they ought, therefore, to do the ſame; but I appeal to facts if this is the caſe. Does not red precipitate, when applied to a ſore, inſtantly excite a violent action in the part? Do not corroſive ſublimate (oxygenated muriate of mercury,) and white arſenic (white oxyde of arſenic) act in the ſame manner? If theſe ſubſtances produce their effects in no other

 way

way than by causing an accumulation of the principle of irritability, where is the stimulus which produces the inflammation? The oxygene which these bodies are supposed to yield cannot be at the same time the principle of action, and the exciting cause of action. If a negative stimulus of this kind were taken into the stomach, one would naturally imagine it would cause an accumulation of irritability in the whole of that organ, and if any stimulus were to act on the part, a general inflammation of that organ would ensue. But how is this to be reconciled to the fact? When a person dies who has been poisoned by arsenic, is not the inflamed part limited to those places with which the arsenic has been in contact? A highly inflamed, and sometimes gangrenous spot, not larger than a shilling, or a half-crown piece, is discovered. All the rest of the stomach, except it be those places immediately surrounding this spot, are in general but slightly inflamed.

The manner in which stimuli act, and produce the contraction of muscular and other

irritable

irritable parts of the body, are phenomena which muſt awaken the ſpirit of inquiry in every man who has the ſlighteſt tincture of it in his mental compoſition; but it is not by crude and haſty conjectures that we can arrive at a knowledge of theſe myſterious intricacies of nature. It is, for this reaſon, that the inveſtigation of theſe ſubjects ſhall be delayed until a number of other phenomena have been examined. The deeply learned BACON, and BOYLE, modeſtly conceived that, previous to the formation of general principles, it was firſt abſolutely neceſſary to examine with much caution, patience, and impartiality, every fact connected with the branch of ſcience, to which the general concluſion related; but this ſlow, yet neceſſary proceſs, does not well ſuit the temper of the preſent times. Syſtems are formed in a trice, and conſtituted *theories* by the authority of one or two individuals. We ſimplify every thing in a moſt wonderful manner, and endeavour to approach the ſacred fountain of truth by leaps and bounds, as if we were ſuddenly

endowed with powers totally unknown to the philoſophers of former ages. Man is a fibre which bends itſelf into a ring, then becomes a tube, and then an animal (*a*). The principle of his motions is oxygene (*b*): ideas are motions of fibres (*c*): vegetables have ideas (*d*): children may be begotten of any ſex, ſhape, or feature, at the will of the male parent (*e*). The whole of living bodies are made up of a few airs; and the great globe itſelf is only a ſplinter of a fractured ſun (*f*)!

(*a*) Zoonomia, Vol. 1. Sect. xxxix. (*b*) Girtanner on Irritability. (*c*) Zoonomia, Sect. iii. (*d*) Same book, Sect. xiii. (*e*) Same book, Sect. xxxix. (*f*) Buffon's Theory of the Earth.

CHAP-

CHAPTER II.

ON SENSATION.

Common definition of Senſation; fault found with it; neceſſity of other terms. Nervous impreſſion, what it is. Senſorial impreſſion. Mental perception. External and internal nervous impreſſions. Application of theſe terms in the explanation of various phenomena. New hypotheſis of Senſation. Figure of impreſſion, how to be conceived; its tranſmiſſion from one part of the nervous ſyſtem to another. Examination of opinions.

WHEN a foreign body comes in contact with the extremities of our nerves, a certain change, or affection, is immediately produced in them, of which we are, for the moſt part, conſcious, and which is denominated *ſenſation*, or *feeling*.

The

The capability which a nerve poſſeſſes of being thus affected, is denominated its *ſenſibility*, and the change that takes place in it is ſuppoſed to be an affection of the *energy of the nerves*, or of the *ſentient principle*.

Simple as theſe terms are, it muſt be evident that they do not explain any thing in regard to the effects which external bodies produce in our nerves; and, indeed, they are not ſufficiently expreſſive of the various circumſtances which appear to conſtitute Senſation.

The *firſt* effect ariſing from the action of an external body, which forms a part of ſenſation, is the change that takes place in that part of a nerve to which the external body is applied; the *ſecond* is the change or affection of the brain, which happens in conſequence of the external impreſſion having been communicated to it; and the *third* is the change produced in our mind by this affection of the brain.

The

The two firſt effects are, in a great degree, corporeal, but the third is not to be explained by the principles of any facts in phyſics, of which we have hitherto acquired a knowledge.

It is a circumſtance of remarkable ſingularity, that all our beſt metaphyſicians ſhould agree in conſidering ſenſation as a mere affection of the mind, and that men, acquainted with the œconomy of the animal, ſhould, in their phyſiological writings, have ſo ſervilely copied after them. We ſhall ſoon be convinced that the affections of the brain and nerves, which ariſe immediately from the action of an external body, are phenomena totally diſtinct from thoſe produced on the mind. It becomes neceſſary, therefore, to diſtinguiſh them from each other by different appellations.

To the change produced in the nerve by the application of an external body, we apply the name of *nervous impreſſion*. To the ſecond, or change produced in the brain, by the communication of a *nervous impreſſion*, I give the name

name of *ſenſorial impreſſion* from the word *ſenſorium*. Now we ſhall afterwards find reaſon to believe, from many phenomena, that it is only under certain conditions that we become conſcious of any nervous impreſſion, even although we have proof that it has been communicated to the brain. But when an impreſſion is conveyed from the extremities of a nerve to the mind, we then call that affection of the mind a *mental perception*. It is ſurely unneceſſary to remark, that a mental perception is totally diſtinct from the conſciouſneſs we have of it. A mental perception is a mere impreſſion as it were; a paſſive effect, produced on the mind by means of external objects. Our perceptions of external bodies correſpond in number, kind, and force, with our feelings; but conſciouſneſs is the quality of ſome active principle reſiding in the mind, by means of which we know not only when it is acted on by external agents, but alſo when it exercifes its own faculties, and moreover what the reſult of theſe operations are.

As it is of great importance to discriminate accurately between these different affections, especially between nervous impressions, and consciousness, since they have been too frequently confounded with one another under the general term sensation, I shall endeavour to give a clearer notion of them by one or two illustrations. Other examples will frequently occur afterwards.

First, it may be mentioned that nervous impressions are of two kinds, as justly remarked by the learned UNZER. They are either *external*, or *internal*.

By *external nervous impressions* are meant all such as arise from the application of any body to that extremity of a nerve which is most remote from the brain, let that nerve terminate in whatever part of our frame it may. Therefore all impressions on the extremities of the nerves of the skin, eyes, nose, ears, mouth, stomach, intestines, kidneys, bladder, &c. are to be considered as external impressions.

On the other hand, *internal nervous impreſſions* are, firſt, all ſuch as take place at the origin of the nerves, as they ſpring from the brain, or ſpinal marrow, and in ſuch caſes they are, in general, nothing elſe than the mere communication of a *ſenſorial impreſſion*; or, ſecondly, they may ariſe in any part between the origin of a nerve, and its extremity. Thus, ſuppoſe any animal, which retains life for a long time, ſuch as a frog, or turtle, to be decapitated, and the ſpinal marrow irritated, ſo as to produce convulſions in all the muſcles, ſuch an irritation is to be conſidered as an internal nervous impreſſion; water in the brain, or blood effuſed on its ſurface, producing general convulſions, are in like manner to be conſidered as ſo many bodies, creating internal nervous impreſſions.

In our ideas of external and internal impreſſions, the brain may be conſidered as the center of a great circle, and the remote extremities of the nerves as its circumference. Every impreſſion which proceeds from the circumference to the center is to be conſidered

as

as external, and every one on the contrary, that proceeds from the center to the circumference, is internal. In this way, one and the ſame impreſſion may be both external and internal as to its ultimate effects; for inſtance, if it be received on a part of any nerve, which lies between the center and circumference. When a blow is received on a well known ſpot near the elbow, a perſon is generally conſcious of it, both at the part where it was received, and alſo at the extremity of the little finger. The impreſſion, as to its effects on the mind, by which a perſon becomes conſcious of it, may be called *external*, and as to its effect on the remote extremity of the nerve in the finger, *internal*. The diſeaſe to which phyſicians have given the name of epilepſy, conſiſts in the patient's being ſuddenly deprived of all the mental faculties, and of the conſciouſneſs which attends their operation, while the muſcles of voluntary action, and many of thoſe of involuntary motion, are thrown into the moſt violent convulſions, reſpiration, and the circulation, continuing free, or but little impeded. It is

alſo

alſo a well known fact, that this diſeaſe may ariſe from local irritation, ſuch as worms in the inteſtines, or from matters which vellicate or diſturb the ſtructure of theſe delicate parts.

The explanation of all theſe phenomena naturally enough preſents itſelf, after what has already been ſaid concerning the effects which follow the action of external bodies, on any ſet of nerves.

All impreſſions on the extremities of theſe bodies are naturally determined to the brain. It is probable that the compreſſion on the brain, called *ſenſorial impreſſion*, always correſponds in kind with the original impreſſions on the nerves. When theſe are weak, it is but ſlight, when violent it is greatly diſturbed. But it ſeems natural to ſuppoſe, that when the organization of the brain is much deranged by the violence of any impreſſion, it no longer becomes fit to act upon the mind, or to be acted on by it. The derangement of the nerves of the inteſtines, by the gnawing of worms, is of this violent kind, and being communicated

communicated to the brain, totally impedes all mental operation. And hence the perſon becomes inconſcious of the impreſſions of external objects, and falls down ſenſeleſs. Yet the ſenſorial impreſſions ariſing from the irritation of the worm produce their phyſical effect on the origin of other nerves, and are tranſmitted along their courſe to the muſcular parts of our frame. They act like any other phyſical ſtimulus, and incite them to ſtrong action. They are repeatedly relaxed and re-excited according to the firſt law of irritability.

From this we learn that mere impreſſions on the nerves and brain are quite diſtinct from the affections of the mind; and when we ſpeak of theſe impreſſions in general, we ſhall always mean the corporeal affection, in contradiſtinction to mental perception, which only takes place when the impreſſion operates on the mind. This ſubject will be further elucidated in the ſucceeding parts of this work.

Our

Our next inquiry is a very intricate one. *What is the nature of that corporeal change produced in our nerves by the action of an external body, to which the name of nervous impreſſion has been given?*

When any body is applied with force againſt another, two diſtinct effects are immediately produced; a certain quantity of impetus, or momentum, as it has been called, is communicated from one to the other, which tends to diſplace it from the ſituation it has, in regard to the bodies which ſurround it: and, *ſecondly*, thoſe particles of each of the two bodies which are made to come neareſt to perfect contact in the moment of concuſſion, are deranged as to the ſituation they were in previous to the moment of concuſſion.

This derangement, or diſplacement of particles, is different in different bodies, and it is alſo different in the ſame body, under different circumſtances.

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In the *firſt* place, it varies according to the degree of force with which the two bodies ſtrike each other. In ſome inſtances it only occaſions a temporary diſplacement, for as ſoon as the moment of concuſſion is paſt, the particles reſume their former ſituation; thus, when two ivory balls are ſtruck together, the particles of which each ball is compoſed ſuffer a temporary compreſſion, and the balls become flatter; but as ſoon as the external force ceaſes, the particles regain their former ſituation. At other times the derangement of particles is permanent. This is of two kinds. In the one caſe the particles of one of the bodies are ſo far removed, by the external force, from the reſt of the maſs, as to deſtroy their attraction for it, and they conſequently are completely ſeparated from it. In the other inſtance, the particles of the body ſtruck are ſo far diſtant from their ſpheres of mutual repulſion, that they remain in the poſition into which they are forced; as for inſtance, when a ball is ſtruck againſt a piece of moiſt clay.

In the *second* place, the derangement of the particles is different according to the denſities of the two bodies; for it muſt be evident that a hard body will occaſion a much greater diſplacement of particles in a ſoft one, than in one of its own denſity, the reſiſting cauſe being neceſſarily leſs.

In the *third* place, it is different according to the elaſticity of the body. The nearer the particles of any body are to their ſphere of mutual repulſion, the more elaſtic that body muſt neceſſarily be. In them a ſlight compreſſion is ſufficient to excite that power into action, and the particles, therefore, have an immediate tendency to regain their former poſition; but as repulſion, or the cauſe of elaſticity, exerts its influence equally in all directions, it is evident that the particles which are next thoſe which have received the blow, muſt alſo ſuffer a ſimilar diſplacement, and their diſplacement will affect thoſe which lie next to them, and thus the impreſſion of the external body is tranſmitted by them to a very great extent. It is on this principle that ſound is quickly conveyed

conveyed to a great diſtance, as well as through ſolid elaſtic bodies. Doubtleſs, there is a point where this effect muſt ceaſe, even in the moſt elaſtic ones, for as no compreſſion can take place without a kind of friction between the particles, the compreſſing power muſt neceſſarily be gradually weakened in its action.

In the *fourth* place, this derangement of the particles of a body ſtruck, is different according to the arrangement of the ſurface of the body which ſtrikes it. This is moſt evident in ſuch as are not very elaſtic. When we preſs our finger on a piece of ſoft clay, we obſerve the marks of the furrows of the ſkin upon it: and on the ſame principle melted ſulphur, glaſs, or wax, receive and retain the impreſſion of many bodies with variegated ſurfaces. The ſame thing muſt neceſſarily happen to elaſtic bodies; but then as the particles reſume their original poſition almoſt as ſoon as the external force is withdrawn, we cannot ſee it. I call this general effect which impinging bodies produce, the *figure of impreſſion*, or ſimply, *impreſſion*.

The facility with which the figure of impreſſion of any body is tranſmitted from the part where it is firſt received, to the reſt of its maſs, ſeems to be in a direct ratio with the repulſive power of the particles of that body. On this account one would naturally imagine it to be greater in the rarer fluids, than in the elaſtic ſolids. In corroboration of which conjecture, it may be mentioned that the various gaſes, or airs, poſſeſs this quality in a much higher degree than ſolids.

That the particles of which bodies are compoſed are not in a ſtate of perfect contact, is a truth eſtabliſhed in phyſics; for, independently of the repellent power with which they are endowed, and which prevents their complete union, a certain portion of heat is conſtantly preſent, which alſo keeps them ſeparate from each other. A convincing proof of this poſition is, that the moſt ſolid body we know may be made to contract in all dimenſions by withdrawing heat from it, and may be made to re-expand by giving it its former

former temperature. The heat either combines itſelf with the particles of the body, increaſing their natural repellent power, or it inſinuates itſelf between them, forming atmoſpheres for each particle; and owing to the great repulſive power which the particles of heat have for each other, they keep thoſe of the body aſunder. When it is aſſerted, then, that the medullary particles which compoſe our nerves, are by no means in a ſtate of perfect contact, it is only aſſerting that they are poſſeſſed of a certain quality which is common to all bodies. The vaſcularity of the cineritious part of the brain, and of the nerves themſelves, their ſoftneſs, pulpineſs, and natural humid appearance, give reaſon to believe that between the medullary particles of which they are principally compoſed, a fine fluid is conſtantly ſecreted, which may be fitted to receive and tranſmit, even more readily than other fluids do, all impreſſions which are made on it. I do not conceive that there is any neceſſity for ſuppoſing it to be of a ſupernatural degree of fineneſs, ſuch as the conjectural æther of authors; nor is it neceſſary to conſider

confider the nerves as tubes in which it circulates. It is a conftituent part of their texture, lying between and furrounding the medullary particles. The particles of this fluid, as well as the medullary part of the nerves, muft, in common with all matter, have each of them their atmofpheres of heat, which probably increafes their natural repellent powers. When any of the particles, then, of this fluid are forcibly deranged from their natural fituation, thofe which have been compreffed act on thofe neareft them, and thus the figure of impreffion is tranfmitted to the brain or to other parts of the nervous fyftem. Hence it follows as a neceffary deduction, that what we confider to be the properties of external bodies, are more properly fpeaking, only alterations of our own nerves. Thefe are caufed, indeed, by certain phyfical properties in the bodies; but our knowledge of thefe properties is combined with the affection of our nerves. It is on this, that is founded, in a great degree, the diverfity of taftes, or judgments, which different people entertain about the fame external object. But this view of the fubject will

will be more enlarged on in another part of the work.

As the fluid, which conveys the impreffions of external bodies to the brain, appears to be fecreted from the fine veffels which fupply the nerves with nourifhment, fo it neceffarily follows that they muft be varioufly affected by every thing which alters the action of thefe veffels; and hence we find two laws of fenfibility very fimilar to thofe of irritability.

1. *All ftimuli which excite an increafe of vafcular action, increafe the fenfibility of the nerves, but by doing fo, the principle of fenfation, as well as the principle of irritability, are gradually exhaufted.* A certain quantity of food, wine, heat, and exercife, all render a perfon more lively, and more awake to the impreffions which are made on his fenfes; for, by means of thefe ftimuli, the action of the whole arterial fyftem is increafed, and, confequently, all fecretions go on more rapidly than they did before. The nervous fluid is diffufed more copioufly

copiously between the particles of the medullary subſtance of the nerves, and from this diſtention a kind of pleaſurable ſenſation ariſes, which is felt all over the frame. It is then that we are moſt diſpoſed for every fine and are moſt hurt by every painful feeling. Then, the deſires which depend on corporeal ſenſation are apt to be awakened by the ſlighteſt cauſes, as we are ſtrongly prediſpoſed for every thing which can gratify the ſenſes: but if the ſame ſtimuli be too great, the irritability of the body is exhauſted; ſecretion is diminiſhed, the nervous fluid is ſcantily formed, and we become dull, ſtupid, and languid. Our eyes do not feel the light, nor our ears the rays of ſound; the brain does not receive the impreſſions of volition, or any of the mental operations, and we fall into a ſtate of torpor, called ſleep.

2. *When nervous ſtimuli are diminiſhed, and arterial action ſupported at the ſame time, the nervous fluid is neceſſarily accumulated, and ſenſibility thereby increaſed.*

Hence

Hence it happens that all our ſenſations are increaſed after we have been ſome time without having had them excited. A perſon who has been long ſhut up in the dark, cannot, for ſome time afterwards, eaſily bear a moderate light. A perſon in health who is prevented from having much intercourſe with ſociety, has a high reliſh for the few gratifications which he can obtain. The taſte of wine, and of food, is moſt enjoyed by him who uſes them ſparingly. From this it may be eaſily underſtood why healthy feelings, and healthy deſires, can only be preſerved by thoſe who are moderate in their enjoyments.

Although the various opinions which have hitherto been offered concerning the cauſe of ſenſation appear to be extremely different from each other, yet they may all of them, with much propriety, be reduced under the three following claſſes.—*Firſt*, thoſe which account for it by certain vibrations of the nerves themſelves; *ſecondly*, thoſe which ſuppoſe the exiſtence and motion of a particular fluid.

fluid. And *thirdly*, the actual motion of the nervous filaments themſelves.

In regard to the firſt of theſe doctrines, it is to be remarked, that we have no other notion of vibration than that which is yielded to us by the vibration of elaſtic bodies, ſuch as the chords of muſical inſtruments, or the tremor of a bell, &c. If the hypotheſis, then, be examined as to the ſpirit of its analogy, the refutation of it becomes eaſy; for in order that any body may vibrate, ſeveral conditions are neceſſary, none of which are peculiar to our nerves. It muſt be elaſtic, tenſe, and free from all contact with other bodies, except at the points of its ſupport, beyond which points vibration does not proceed; but the nerves are neither elaſtic, nor tenſe, nor free from contact with other bodies in any part of their courſe, and conſequently they cannot have any motion analogous to the vibration of a ſounding body. If it be ſaid by any author that the vibration of a nerve is a diſtinct thing from the vibration of a ſounding chord, or, in other words, is a vibration, *ſui generis*, it is impoſſible

impoſſible to refute ſuch an aſſertion, becauſe in fact nothing is explained by it. It refers to an occult cauſe, which the author himſelf does not comprehend, and therefore cannot elucidate by language.

With regard to the ſecond ſet of opinions, namely, the exiſtence and motion of a particular fluid, phyſiologiſts have been much divided, not only concerning the nature, but alſo concerning its peculiar mode of operating. Some regard it as the electrical fluid, others as a magnetic fluid, and others have choſen to give it the name of æther.

It would be an uſeleſs and tireſome taſk were I to adduce all the arguments with which the authors of theſe opinions endeavour to ſupport them, together with the objections which may be oppoſed to them; he who wiſhes to read almoſt every thing valuable on the ſubject muſt conſult the 10th Book, and 8th Sect. of HALLER's phyſiology of the human body. It may be briefly remarked, however, that the phenomena of ſenſation do not correſpond with

with the well-known phenomena of electricity, or magnetiſm. Electricity, indeed, produces ſenſation, and when tranſmitted in a certain quantity, it operates as a powerful ſtimulus upon the irritable parts of our frame, exciting immediate action in them; but this is an effect which it has in common with various other ſtimuli. Electricity is a matter which like heat is contained in a certain proportion in every body, and conſequently the nerves muſt have their portion; but this is no proof that it is the medium through which we receive the impreſſions of external objects. If it were the medium of our ſenſations, there would be no need of any ſuch bodies as nerves, for as it pervades the whole human frame, impreſſions made upon it could be conveyed to every part of the ſyſtem, without any ſuch contrivance.

Of all vague conjectures concerning the nature of the nervous fluid, that one which ſuppoſes it to be the magnetic fluid appears the moſt abſurd, ſince there is not even a ſhadow of ſimilitude between the phenomena of

of magnetifm, and thofe of fenfation. The doctrine of æther is as little deferving of any ferious thought; for the exiftence of fuch a fluid has never been proved, and even if it were demonftrated, it is hardly poffible to conceive that it fhould be endowed with all the fanciful virtues which thofe who believe in it fuppofe it to be poffeffed of. It is one of thofe imaginary occult qualities, by which the ancients attempted to explain many phenomena they did not underftand, fuch as the motion of the heavenly bodies, the refulgency of the fun and ftars, the life of animals, and the growth of plants, &c.

In order to underftand Dr. DARWIN's opinion concerning the ufe of the nerves, it is neceffary to be acquainted, in the firft place, with the definitions which he gives of the "*immediate organs of external fenfe*," and of idea. "The immediate organs of external "fenfe," fays the Doctor, (Zoonomia, vol. I. p. 11.) "confift of moving fibres, enveloped "in the medullary fubftance above men- "tioned; and are erroneoufly fuppofed to be "fimply

" ſimply an expanſion of the nervous medul-
" la, as the retina of the eye, and the rete
" mucoſum of the ſkin, which are the imme-
" diate organs of viſion, and of touch. Hence
" when we ſpeak of the contractions of the
" fibrous parts of the body, we ſhall mean
" both the contractions of the muſcles, and
" thoſe of the immediate organs of ſenſe."

His notion of idea is as follows: " The
" word idea has various meanings with the
" writers of metaphyſic: it is here uſed ſimply
" for thoſe notions of external things which
" our organs of ſenſe bring us acquainted
" with originally; and is defined a contraction
" or motion, or configuration of the fibres,
" which conſtitute the immediate organ of
" ſenſe."

The arguments on which Dr. DARWIN attempts to found his hypotheſis concerning the contractility of the nerves, are a number of concluſions drawn from the phenomena of ocular ſpectra. " Place," ſays the Dr. vol. I. p. 16,

p. 16, " a circular piece of red ſilk about an " inch in diameter, on a ſheet of white paper, " in a ſtrong light; look, for a minute, on " this area, or till the eye becomes ſomewhat " fatigued, and then gently cloſing your eyes, " and ſhading them with your hand, a circular " green area, of the ſame apparent diameter, " becomes viſible in the cloſed eye. This " green area is the colour reverſe to the red " area, which had been previouſly inſpected. " Hence it appears, that a part of the retina, " which had been fatigued by contraction, " relieves itſelf by exerting the antagoniſt " fibres, and producing a contraction in an " oppoſite direction, as is common in the " exertion of our muſcles. Thus, when we " are tired with long action of our arms in " one direction, as in holding a bridle on a " journey, we occaſionally throw them into " an oppoſite poſition, to relieve the fatigued " muſcles."

The deluſive concluſion which is here preſented to the mind, ſeems to ariſe in a great degree from employing the word reverſe, in the

the ſame ſenſe as the word oppoſite. The relaxation of a muſcle may, with great propriety be ſaid to be a ſtate which is *oppoſite* to that of its contraction; but ſuppoſing, for a moment, for the ſake of argument, that ſenſation is nothing elſe than the contraction of fibres, ſimilar to the contraction of a muſcle, we then cannot ſay with the ſame propriety, that any one colour, although reverſe to another, indicates an oppoſite ſtate to contraction; for, as all ſenſation is ſuppoſed to be a kind of muſcular contraction, and every colour a ſenſation, the green ſpectrum which is ſeen after looking at a red object, indicates contraction as much as the red one does. The author of the Zoonomia ſeems to have been aware of this deduction; for, in the paſſage cited above, which is very ſimilar to one in a paper publiſhed in the Philoſophical Tranſactions, on the ſubject of ocular ſpectra, by the late Dr. R. W. DARWIN, of Shrewſbury, the green viſion is not compared to relaxation, but to the contraction of antagoniſt muſcles.

This explanation, and illuſtration of the man holding the bridle, ſhews that Dr. DARWIN

DARWIN confiders the optic nerve like an arm, having flexors and extenfors, and fingers to grafp with, by means of which it may affume various gefticulations. But I leave it to the good fenfe of every man who has feen a nerve to fay, whether its difpofition and internal fabric, affords the flighteft proof in favour of fuch a fanciful notion as this. If every nerve has antagonift fibres, there muft be fome part of a nerve fitted for their infertion. Is the evidence which we have of their foft and pulpy texture capable of being reconciled with fuch an opinion? If the nerves are to be compared to mufcles, the comparifon muft be adhered to ftrictly; and each fingle nerve confidered as a fingle mufcle. The optic nerve of any one eye being a fingle nerve, is to be regarded according to the fpirit of the comparifon, as a fingle mufcle. Now a fingle mufcle is capable only of various degrees of contraction and relaxation; that is, it exhibits only two phenomena, which are oppofite to each other; for the mere degrees of contraction, or relaxation, are not varieties in kind. But the optic nerve is capable of

receiving innumerable ſenſations, all diſtinct from each other.

Dr. DARWIN ſays " that if the change or " motion of the retina was a mechanical im- " preſſion, or a chemical tinge of coloured " light, the perception would every minute " become ſtronger and ſtronger; whereas, in " the experiment with the piece of ſcarlet " ſilk, it becomes weaker and weaker." That all impreſſions muſt neceſſarily become weaker the longer they are continued, follows from the nature of the ſentient principle; for if it depends on the action of veſſels, or, in fact, any living action whatever, it muſt be exhauſted by ſtimuli long applied. But let us ſee to what thoughts this fact leads us, having Dr. DARWIN's hypotheſis in view. It is an invariable law of all contractile parts, that when a ſtimulus has been ſo long applied as to exhauſt that principle on which its contractility depends, it falls into a ſtate of relaxation. Now granting that the retina is a contractile part, it follows, that when it has been completely excited by any ſtimulus, the

rays

rays of light for inſtance, which come from a piece of ſcarlet ſilk, then the retina muſt fall into relaxation, or an oppoſite ſtate. Now if the green ſpectrum be an idea in the mind, excited by the relaxation of the optic nerve, this ſame coloured ſpectrum ought always to be ſeen as often as the retina has been previouſly fatigued. But this we know is not the caſe. Ocular ſpectra are of various colours; many people cannot be made to ſee them; and in different people the ſame object ſhall excite different coloured ones. I certainly do not pretend to account for theſe phenomena. I do not think we have yet a ſufficient number of facts on which a good hypotheſis may be built. But it muſt be evident to every impartial man, that ſo far from their proving any analogy between ſenſation and muſcular contraction, they ſtand in direct oppoſition to it.

CONTINUATION

OF THE SAME SUBJECT.

Application of the hypothesis of sensation to the principal phenomena of the external senses.

THE particular contrivances by which the Great Author of nature has fitted us for acquiring that degree of knowledge of external bodies, which it has been deemed proper we should obtain in our present state of existence, are denominated the external senses.

It is not my intention to enter into a minute detail and examination of the wonderful phenomena which these curious organs offer to a reflecting mind, far less to attempt a description of their wonderful structure, for this would lead me much beyond the limits within which I have proposed to confine my researches. To point out the striking analogy which exists between the whole of the senses, in regard to the manner of their being affected by external bodies, and also in regard to their effects on the mind, are the objects of this chapter.

Our

Our external ſenſes are five in number: the ſenſe of touch, the ſenſe of ſeeing, the ſenſe of hearing, the ſenſe of ſmelling and the ſenſe of taſting. In their relationſhip with external bodies, they may be ſaid to differ from each other in two particulars; *firſt*, in as much as each of them is fitted to receive the impreſſions of certain bodies which produce no ſenſation in the others; *ſecondly*, in as much as the ſame body does not produce a ſimilar ſenſation on any two of them. The ſound of a cannon which cauſes a ſenſation in our ears that can hardly be ſupported, has no influence on the nerves of our noſe, although much more expoſed than thoſe of the organ of hearing; a vivid light which produces pain in our eyes, has no effect on our organs of taſte; the rays of the ſun produce a very different effect on the organ of touch, from what they do on the organ of viſion, &c. Upon what principle this difference in the nerves of our external ſenſes depends, is by no means eaſy to explain. It may probably be owing to a variety of cauſes exiſting in the œconomy of the nerves themſelves; for, although they all ori-

 ginate

ginate in the brain, it does not follow that they ſhould all of them have exactly the ſame internal ſtructure. Thoſe of the external ſenſes may be as different from each other as the various other organs of the human frame. We find that the arrangement and action of the ſmaller arteries of the ſyſtem are different in different parts, and it is therefore not in oppoſition to analogy to imagine, that although all the arteries of nerves agree in reſpect to their ſecreting a particular fluid, yet that fluid may be differently modified in thoſe of the eye from what it is in the nerves of the noſe, the mouth, or the ear, &c.

The ſeat of the ſenſe of touch is in the nerves of the rete mucoſum, and ſkin of our body, but it is much more acute in ſome parts than in others, ſuch as our fingers; and in order that this exquiſite ſenſe with which theſe parts are endowed may be employed to our advantage, they are formed in ſuch a manner as to examine an extenſive ſurface. To the different impreſſions which external bodies make on the nerves of our ſkin, we apply different

different names, or ſigns, which, with a little modification we alſo apply to the ſuppoſed qualities of the bodies that excite the impreſſions; thus, external bodies, which act upon our ſenſe of touch, are ſaid to be hard or ſoft, wet or dry, rough or ſmooth, hot or cold; and the particular qualities in the bodies themſelves, which we imagine produce the different impreſſions, we call ſolidity, moiſture, roughneſs, ſmoothneſs, heat, cold, &c. Theſe, together with a very limited knowledge of the ſhape and weight of bodies, conſtitute the whole of the knowledge of the external world, which we acquire by means of this ſenſe.

With regard to thoſe of *taſte* and *ſmell*, there are but few phenomena which require any particular explanation.

By the former we become conſcious of the impreſſions of all bodies which are ſoluble in the ſaliva; by the ſecond, of all ſuch as are fitted to act on the extremities of the olfactory nerves. The bodies which act on theſe are of

of almoſt infinite variety, and hence we have hardly any generic names for impreſſions on this ſenſe.

In moſt of the other ſenſes the caſe is widely different; for although there are many bodies which differ from each other in regard to certain qualities, yet as they produce ſimilar ſenſations, they are often on that account claſſed together; thus, in regard to touch, we have hard bodies, ſoft bodies, moiſt bodies, dry bodies, rough and ſmooth ones, and hot and cold ones. In regard to taſte, we ſay they are ſweet and ſour, bitter or ſalt, &c. and in deſcribing ſuch bodies, therefore, to other people who may not have felt or taſted them, theſe expreſſions are of great uſe. But it is very different in regard to the minute bodies which act on the nerves of our noſe: for they are ſo diverſified in reſpect of ſtructure, that very few of them yield ſimilar impreſſions; and we find ourſelves obliged, therefore, to diſtinguiſh each one by the name of the body which yielded it: thus, we have no other way of expreſſing the ſmell of a roſe, of lavender,

of

of jaſmine, or of a violet, &c. but by ſaying it is the ſmell of a roſe, of lavender, of jaſmine, or of a violet, &c.; which mode of expreſſion explains to us, indeed, the particular perceptions, correſponding to the external impreſſions, but to another who never experienced ſuch impreſſions, they convey no diſtinct idea whatever.

The ſenſes of hearing and ſeeing have ſo many peculiarities, that a little more time muſt be employed in their inveſtigation than what has been allotted to the others, in order to give a tolerably juſt account of the phenomena which they exhibit.

ON HEARING.

WHEN we gently touch any body whilſt it emits a ſound, we feel that it is in a ſtate of tremor, or vibration; but as there is no immediate contact between the body itſelf, and our ear, we cannot conclude that that affection of the organ which we call hearing, ariſes ſolely from the tremor of this ſounding body.

Other

Other obſervations and facts give us more accurate ideas. We have diſcovered by experiment, that all bodies capable of emitting ſound, when placed in a vacuum, do not affect our ear, although they vibrate; and again, as all concuſſions of air, ſuch as thoſe occaſioned by the burſting of a bomb, or of a bladder, the cracking of a whip, or the act of coughing, all produce ſound, we are led to conclude that the tremor of the ſounding body muſt have been communicated to the air, and that it is this affection of the air which operates on our ears. A ſound, therefore, is a compound effect, even before it reaches our organ of hearing.

We proceed to obſerve, that between the expanded extremities of the auditory nerve, and the external air, ſeveral bodies intervene, all of which muſt be more or leſs affected before we hear. Theſe are the external membrane, called the tympanum, a certain arrangement of ſmall bones, immediately behind that ſubſtance, a certain quantity of air, and a liquid,

liquid, the properties of which have not been well inveſtigated.

It was natural to ſuppoſe that if air tranſmitted ſound as an elaſtic body, every other elaſtic one would do ſo likewſe; and accordingly we find this to be true; all elaſtic fluids, ſuch as the different kinds of air, and even water itſelf, communicate ſound. Upon this principle we can alſo be made to hear ſounds through other mediums than thoſe which affect the external ear; for inſtance, if a communication by any elaſtic ſubſtance be made between the bones of our head, and the ſounding body, the peculiar tremor of that body will be communicated to the auditory nerves. The ſtory of a perſon who was deaf, and who enjoyed the muſic of a harpſichord, by applying one end of a cane to the inſtrument, whilſt he held the other between his teeth, is well known.

It is not a juſt concluſion, that the affection of the air, occaſioned by a ſounding body, is analogous to its propulſion, if I may uſe the expreſſion,

expreſſion, or to its common progreſſive motion. A ſounding body, like every other elaſtic one, has two diſtinct motions when ſtruck, each of which produces a different effect. Firſt, its common vibratory motion, by which the body of air in contact with it is propelled; ſecondly, that particular derangement of its particles which I have called the figure of impreſſion; and it is this which when communicated to our ear, produces the ſenſation of ſound.

To prove both of theſe poſitions, namely, the great difference that exiſts between them, and that the latter only is the cauſe of ſound, we have only to attend to the different phenomena which they exhibit. The common motion of air, as communicated by a vibrating elaſtic body, can be felt by the nerves of the ſkin, and when violent, it diſturbs every light ſubſtance around it, cauſing even a rupture of the tympanum of the ear itſelf, which effect indeed, is commonly, but falſely aſcribed to the ſound.

But

But as the progrefs of found, or of the figure of impreffion, confifts only in a mere derangement of the fituation of the component, or invifible particles of a body, in regard to their diftance from each other, and not in the motion of the body, as a volume, or mafs, it gives no impulfe fufficient to put any other one in motion, and confequently we find the very lighteft of all, fuch as fmoke, flame, or vapour of any kind, are not at all deranged by it, although thefe tranfmit found equally well as other elaftic fluids.

Again, the common propulfion of a volume of air as ftruck by a vibrating body, is retarded by an oppofite current of air; but found is conveyed againft the wind.

The ftrength or weaknefs of any found depends on the ftrength or weaknefs with which the figure of impreffion is communicated to the ear. It depends, therefore, originally, on the force of the ofcillatory motion of the founding body.

When

When we hear and compare ſeveral ſounds, we have the idea of what is called a note, or tone in muſic.

The tone produced by a thick and long chord, which is not greatly ſtretched, we call a deeper tone than one produced by a thinner, ſhorter, and more highly diſtended one. Now, as the only difference between the effects of theſe two chords conſiſts in this, that the thicker, longer, or leſs diſtended chord, vibrates leſs frequently in any given time, than one which is thinner, ſhorter, and more highly diſtended, we ſay, that the difference between a high and a low note conſiſts in this, that in the former, (the high note) the impreſſions communicated to the air ſucceed each other more rapidly in a given time than in the latter.

If we take two chords of equal thickneſs, and equally diſtended, but one of which is only half as long as the other, the ſound of the one ſeems to our ear a mere repetition of the ſound of the other, with this only difference, that the one which is ſhorteſt gives a ſound

ſound that appears higher than the other. In muſic, ſuch ſounds, namely, thoſe which appear mere repetitions of each other, and differ only in the highneſs or lowneſs, are called octaves, the higher octave having double the number of vibrations in a given time than the lower.

Between any two octaves the ear is ſenſible of a number of other notes, or tones, ſeven of which are called radical, in the theory of muſic, and the other five half-tones.

Theſe differ from each other only in the difference there is in the number of impreſſions communicated in the ſame ſpace of time; for inſtance, when two ſounding chords ſtrike the air, in the proportion of two to three, we call theſe fifths to each other; when as four to five, they are called thirds, majors, &c.

It is impoſſible to proceed further in the explanation of theſe phenomena, without entering much more into the theory of muſic than

than what is immediately connected with our ſubject.

As all elaſtic bodies compoſed of different materials muſt be differently arranged, as to their integrant parts, it follows that the figure of impreſſion of each muſt alſo be various; and on this principle we are enabled to explain a difficulty, a ſolution of which, I believe, has never yet been given. How comes it that our ear is able to diſtinguiſh, not only the pitch of any note, and its ſtrength and weakneſs, but alſo to diſcern, as it were, a difference in the ſounding bodies themſelves, from which the tone iſſues? How comes it, for inſtance, that we know that the note A, when ſounded by a flute, hautboy, violin, or harpſichord, comes from thoſe different inſtruments even although they are not ſeen.

The ſtrength of a note, we have already ſaid, depends merely on the ſtrength of the vibration in the ſounding body; and the height or pitch of any note on the number of vibrations which it gives in a certain time; but

but this other affection of the air, by which we diftinguifh a difference in the founding body itfelf, is quite diftinct from thefe, and depends folely on the difference in the figure of impreffion given by each vibration of the body to the air, and from that communicated to our ear. The column of air which is emitted by a flute, has a different arrangement of parts from that of a hautboy; the chord of a violin has a different arrangement of parts from that of a harpfichord; and the founding board of the one is alfo of a different ftructure from that of the other, therefore the figure of impreffion in all thefe muft alfo be different.

We next proceed to explain fome of the phenomena of

SIGHT.

The greater number of the more remarkable phenomena of vifion are to be explained by the figure and external ftructure of the eye, and refractory powers of the humours, and by the phyfical properties of light and colours. Thefe, although very interefting in themfelves, muft

muſt be paſſed over in ſilence, as they would require much time and place to be fully diſcuſſed. Beſides, they are not the phenomena concerning which there is ſo much obſcurity and difference of opinion, as a few others which are immediately to be taken notice of, and which more particularly relate to the doctrine of ſenſation that has been advanced.

By means of light, and the organ of ſight, we become acquainted with the ſituation, ſize, ſhape, motion, and colour of external bodies.

The rays of light as reflected from external objects, croſs each other in their paſſage through the eye, and form an inverted image on the retina. In this reſpect, the eye reſembles an apartment, the ſhutters of which are completely cloſed, and into which no light is admitted except by means of one ſmall opening. But it would be carrying our compariſon too far to ſuppoſe the ſoul, or mind, to be a ſpectator, which looked at this image: and much difficulty has ariſen from this compariſon having been already made; for in this

caſe

caſe it is almoſt impoſſible to explain why objects are ſeen in their natural poſition, ſince their image is inverted on our retina.

The rays of light which are reflected from the objects around us are to be conſidered as equally capable of producing an impreſſion upon the retina, as a ſtone is of yielding one to the nerves of the ſkin. Theſe impreſſions are external nervous feelings. It has been a great misfortune in ſcience, that this ſenſe has been too much conſidered as of a ſuperior and diſtinct kind to the reſt. Myſteries have been ſought for in it, which it has been imagined do not take place in the others; and whole volumes have been written to explain them. Two phenomena in particular have attracted the notice of philoſophers. The *firſt* is, that objects are ſeen ſingle with two eyes; the *ſecond*, that objects are ſeen erect, and in their natural poſitions, although it can be proved beyond a poſſibility of doubt, that their image is inverted on our retina.

 Theſe

Theſe phenomena do not appear to have any thing more myſterious in them than what is to be diſcerned in thoſe of every other ſenſe.

How the principle upon which the firſt hinges, ſhould have been ſuppoſed by ſo many philoſophical writers to be peculiar to the ſenſe of ſight, is not eaſily to be explained; and how it ſhould have been attempted to be accounted for, on phyſical principles, except by men unacquainted with the analogies which exiſt between impreſſions on the optic nerves, and thoſe of other nerves, I know not.

The queſtion is ſimply this; how the impreſſion of any body, happening on two diſtinct nerves, ſhould only yield one perception to the mind? It muſt be evident to every one that this difficulty is not peculiar to viſion; men have two ears, yet hear but one ſound. But if this phenomenon appears wonderful in regard to theſe organs, how much more ought it to have ſtruck philoſophers in regard to the other ſenſes, eſpecially that of touch, if the true

true analogy between the ſenſes had been attended to; for here not only two, but ſeveral diſtinct nerves may be impreſſed by one body, and yet only one perception is yielded. If, for inſtance, a perſon takes a large ſtone, or ball, in both his hands, there are many diſtinct nerves which receive the figure of impreſſion, and yet the perſon has only the perception of one body. The analogy may be carried farther. When either of the two eyes is preſſed a little out of its common ſituation, ſo that the image of an object ſhall fall on a different part of the optic nerve of that diſplaced eye, from that which correſponds with it in feeling in the other eye, we have the perception of two objects. The ſame thing holds good in regard to touch. If the impreſſion of any body be made to fall upon two branches of nerves, not accuſtomed to receive ſuch impreſſions at the ſame time, we think we feel two bodies. The common experiment of twiſting the middle finger over the forefinger, and then rolling a hard pea, or ſmall bullet between them, is a ſufficient proof. But the fact is, we ſeem willing to make a wonderful diſtinction between

the feeling of the optic nerve, and that of thofe of the fkin. If the organs of hearing could be difplaced like the eyes and fingers, fo that the radii of found fhould fall upon different parts of the expanfed auditory nerve from thofe which are accuftomed to receive fynchronous impreffions, every fingle found would for fome time appear as two; at leaft, the analogy of the other fenfes juftify this conjecture. With regard to the works written with a view of illuftrating the curious phenomenon in queftion, it may be obferved that the greater part of them, fo far from explaining its fingularity, only remove it a ftep. Thofe who pretend to account for it on mathematical principles, endeavour to difcover what that particular direction is in which an external object muft be placed, in regard to the two eyes, in order to be feen fingle. But fuppofing this to be afcertained, as I believe it has lately been by my friend, Dr. Wells, ftill the myfterious part of the phenomenon remains to be accounted for: I mean, how the impreffion, or image that falls on each eye, fhould only give a fingle perception to the mind.

Two other phenomena of viſion have much engaged the attention of philoſophers, the *firſt* concerns the diſtance of objects, and the *ſecond* their ſituation. Thoſe who are willing to account for every thing which concerns this ſenſe, upon geometrical principles, aſſert that the angle made by the optic axis with the object, is the circumſtance upon which the true explanation hinges. According as the angle is more or leſs obtuſe, ſo does the object appear to be nearer or farther from us; for when a body is placed near to the eyes it neceſſarily makes a larger angle than when it is at a greater diſtance.

In regard to this doctrine, it may be obſerved, that as it puts experience entirely out of the queſtion, ſo it would be fair to conclude, if the opinion were true, that all men who ſee equally well at equal diſtances, ought to be equal good judges of diſtance itſelf; but this we know to be contrary to fact.

Men whoſe profeſſion obliges them to exerciſe their eye, with a view of acquiring juſt notions

notions concerning diſtance, find, in the firſt place, that the talent is conſtantly improved by habit; and, in the next place, that they ſoon acquire a ſuperiority in this reſpect over other men, whoſe organs of ſight are equally good as their own. But if we ſaw by angles and lines, or any other geometrical figures, theſe facts would be inexplicable. There are no two men who judge with equal accuracy concerning diſtance.

That an external object makes a greater or leſſer image on the retina according as it is more or leſs near to the eye, is a fact which can be geometrically proved. In childhood we learn by experience, that as we approach any object it always appears larger to us, and on the other hand, the farther we retire from it the leſs it ſeems; and as we are conſtantly employed in ſuch kinds of experiments, we ſoon form a judgment of the diſtance of ſurrounding bodies by the ſize of the impreſſion (image) which they make on the eye. Independently of our moving to and from the objects around us, by which means we acquire a

notion

notion of their relative diſtance, there is another common way by which we rectify our judgments in this reſpect, and which at the ſame time teaches us to judge of the relative magnitude of objects; I allude to the ſenſe of touch. Our locomotive faculty, and the ſenſe of touch, afford us that kind of experience upon which, in infancy, we found our judgments concerning diſtance; and theſe judgments being accompanied by particular ſenſations in our eye, they naturally become aſſociated in our mind; and hence, when one and the ſame body makes a more extenſive image at any one time, than it does at another, we conclude it to have been nearer to us at the one time than it was at the other. The ſtrength of that principle by which our ideas are aſſociated together in the mind, is in no inſtance more clearly proved than in the preſent. If a perſon from his infancy had never ſeen objects but through a reverſed teleſcope, ſtill he would be as good a judge of the relative diſtance of objects as any other man, provided he could tranſport himſelf from object to object, and make uſe of his hands. But if

if any other man looks through a reverſed teleſcope, the diminutiveneſs of the objects awakens in his mind the idea of a great diſtance. He ſees the objects as ſmall as if they were far from him, and he is inclined to believe them to be far from him.

The other queſtion concerning our being ſuppoſed to ſee objects in a contrary poſition to that in which they are repreſented on our retina, can only be anſwered by the application of the ſame principles. We are taught in our infancy to apply the words low and lowermoſt to thoſe bodies, and parts of bodies which are neareſt the earth; and to thoſe bodies, and parts of bodies which are more remote from the ſurface of the earth, we apply the name of uppermoſt, and thus we are taught to call the head the uppermoſt part, and the feet the lowermoſt part of our body. Theſe terms, and others, having a ſimilar ſignification, we are taught to apply in our infancy to all bodies which have an analogous ſituation to the earth with ourſelves. Although objects, therefore, are inverted on our retina,

retina, ſtill as they have the ſame relative ſituation in regard to the ſurface of the image of the earth, as they have in reality, we conſequently aſſociate the notions of uppermoſt to thoſe things, and parts of things, which are moſt remote from the earth. If an erect object is reverſed, we neceſſarily think it turned upſide down, although its head be now uppermoſt on our retina; for as we have never been accuſtomed to aſſociate the perceptions we derive from the impreſſions made on the upper part of our retina, with our ideas of what is uppermoſt in the external world, ſo a figure which is reverſed muſt naturally appear reverſed to us.

It has long been a queſtion among philoſophers and phyſiologiſts, whether two different ſenſations, ariſing in one and the ſame organ of external ſenſe, can be felt at one and the ſame time: for inſtance; whether upon taking a hot, heavy, ſolid, and ſmooth ball, into one's hand, the perſon feels at one and the ſame moment, that the ball is hot, heavy, ſolid, and ſmooth; or, if theſe ſenſations are only

only felt one after the other. The difficulty involved in this queſtion would never have occurred had clear notions been entertained concerning the office of the nerves, which conſtitutes phyſical ſenſation. Moſt philoſophers have been of opinion that the ſenſations ſucceed each other, for they cannot explain upon the principles of vibration or undulation, how theſe ſenſations, as they call them, are felt at the ſame time.

The queſtion itſelf is a very vague one, and cannot be determined if our reſearches and reaſoning are confined to the two poſitions included in it, or if it be imagined that the queſtion is to be reſolved by proving one of them to be true in all caſes of mixed ſenſation.

Without confining our view of the queſtion, therefore, to either of the two oppoſite poſitions, I would remark

1ſt. That the nerves of external ſenſe are capable of tranſmitting mixed as well as ſingle impreſſions.

2dly. That

2dly. That the mind is capable of apprehending theſe mixed impreſſions in their mixed ſtate; but at the ſame time, by the proper employment of the faculty of attention, they may be analyzed ſo that the mind ſhall apprehend each of the ſingle impreſſions of which the mixed ones are compoſed.

Theſe poſitions are proved to be true by a great number of obſervations. When a perſon enters a green-houſe, where the air is richly impregnated with the ſweet ſcents of many odoriferous plants, he is immediately made ſenſible of a perfume which is quite diſtinct from that of any of the flowers which compoſe it. The art of cookery exhibits ſimilar phenomena. Certain mixtures of ſapid bodies produce a complicated impreſſion on the nerves of the mouth and tongue, and one which is very different from that which any of the bodies which enter into the compoſition would have done ſingly. In ſuch caſes, the impreſſion made on the nerves is evidently of a mixed kind.

That

That we can analyze various mixed impref-fions, and not only difcover the individual ones of which it is compofed, but can at pleafure attend to any one of them, to the exclufion of the reft, is a fact which is alfo proved by daily obfervation. A mufician can either attend to the whole body of found emitted from various inftruments in a concert, or he can at pleafure attend folely to the firft violin, or flute, violencello, or organ, or any other inftrument. A mufical chord makes a very different impreffion on the ear from any one of the notes of which it is compofed; yet an ear accuftomed to mufic hears diftinctly the third, fifth, and octave, or any other note or notes of which it is compofed. When a perfon fuddenly grafps an unknown fubftance, he being at the fame time blindfolded, or blind, he is confcious that the firft impreffion it makes is a confufed and unufual one, which generally alarms him fo much that he cannot attend to any of the qualities it has in common with other bodies: if he continues to hold it in his hand, he then begins to examine it by directing

directing his attention ſucceſſively to the various impreſſions it makes.

Upon the whole, therefore, I think it may be concluded, in regard to the laſt queſtion, that when a body capable of affecting the ſame nerve, or ſet of nerves, in a variety of ways, is applied to ſuch a nerve, or nerves, the various impreſſions which it is capable of yielding, take place at one and the ſame time; and the mind either may apprehend them in their mixed and confuſed ſtate, or under certain circumſtances may attend to the individual impreſſions of which the mixed one is compoſed.

CHAP-

CHAPTER III.

ON THE SENSE CALLED CAENESTHESIS, OR SELF FEELING.

THE five ſenſes which have been deſcribed are properly called external, not only on account of their ſituation, but alſo of their office. They are the means by which we are connected with the things around us; they direct us in our operations as agents, and warn us of the agency of others; many of our pleaſures and pains ariſe from the impreſſions which are made on them; and all our knowledge of the external world, and of the bodies which compoſe and inhabit it, can only be gained through their means.

It has been ſaid, that although the nerves of the various external ſenſes appear to the eye

eye of the anatomiſt, even when aſſiſted by the fineſt glaſſes, exactly ſimilar to each other in ſtructure; yet there can be no doubt that there is ſome difference, either in their more minute organization, or in the nature of that principle on which their property of feeling depends, for many bodies which greatly affect ſome of them, produce no affection in the others; thus the rays of light which affect the retina are not felt by the nerves of the ear, noſe, or tongue; odoriferous bodies which affect the nerves of the noſe, produce no change in thoſe of the mouth, ſkin, or ear; and the impreſſion of bodies, which the air receives from ſounding bodies, do not affect the nerves of the eyes, noſe, mouth, or ſkin.

As the diſtinction we make between theſe five, depends entirely on the principle, that the nerves of each organ of ſenſe are ſo conſtructed as to receive peculiar and diſtinct impreſſions from thoſe of the reſt; and as all the nerves of each different viſcus, or organ of the body, are ſubjected to the influence of the

the ſame principle, it would at firſt ſight appear juſtifiable to make as many ſenſes as there are various viſcera; thus, as it may be proved that the nerves of the ſtomach feel differently from thoſe of the liver, and thoſe of the liver differently from thoſe of the inteſtines, and thoſe of the inteſtines differently from thoſe of the kidneys, thoſe of the kidneys different from thoſe of the bladder, lungs, heart, brachea, œſophaghus, &c. each of theſe parts might be ſaid to be the ſeat of a diſtinct ſenſe.

But as all the ſenſations we derive through the nerves of theſe parts are obſcure, and do not give us any clear information of the qualities of the bodies which are applied to them, as they only yield us the general feelings of health, internal eaſe, and comfort, or their oppoſites, bodily uneaſineſs, pain, and diſeaſe; on theſe accounts they may all of them, together with the nerves of muſcles, of veſſels, and bones, &c. be conſidered as conſtituting ſenſations of one and the ſame kind.

It

It is in this light that a few German physiologifts confider them; and, doubtlefs, the principle is juft, in as much as it is confiftent with found analogy. They confider thefe feelings as belonging to a diftinct fenfe, which they denominate *felbft-gefühl*, and *Gemeingefühl*, and which I have chofen to tranflate literally, and call in Englifh, *felf-feeling*. A very ingenious inaugural differtation has lately been publifhed at Halle, in Saxony, on this fubject. To it I beg leave to refer fuch of my readers as defire a more ample account of the properties afcribed to the fenfe than what are here enumerated. See *Commentatio de Caenefthefi Differt. Inaug. Medica Auctore, Chrift. Fred. Hubner*, 1794.

The feat of this fenfe is in the extremities of all the nerves of the body, except thofe which fupply the organs of the five external fenfes.

The permanency and uniformity of the impreffions we receive by it, when in health, render us lefs confcious of being poffeffed of it; for in thofe who are free from difeafe

there is no preternatural aſtion of any ſet of veſſels, no unuſual diſtention, or relaxation of any part, and conſequently no new cauſe of ſenſation, agitating the frame, ſufficient to withdraw attention from ſurrounding objects. That we derive a feeling from ſuch a ſtate, however, and one of a very agreeable kind to us, is evident from the many common and trite expreſſions of people in health, who ſometimes tell us they *feel* as light as a feather; they *feel* as if they had a ſpring in every limb, &c. This feeling is of the agreeable kind; and to one who is juſt recovered from a painful diſeaſe, is a ſtate of real enjoyment. The Germans call it the feeling of well-being, or health, *Gefühl des wohlſeyns*.

On the other hand, the ſenſations of laſſitude, fatigue, and weakneſs, the pains in the limbs which occur in moſt fevers, all uneaſy ſenſations in the ſtomach and inteſtines; thoſe of anorexia and nauſea, and the painful uneaſineſs which takes place when the bladder is greatly diſtended, are all referred to this ſenſe.

There

There is another kind of feeling, aſcribed to it by HUBNER, which he deſcribes with more accuracy and feeling than elegance of expreſſion. " Huc," ſays HUBNER, " et re-" ferrem ſtimulum ad venerem, hanc acutam " caeneſtheſis febrem, qua homo ſuæ per-" durationis cauſa torquetur. Genitalium " irritabilitas mirum in modum evihitur, " omnes fibræ alacrius tremunt, humorum " ingentes rivuli accurrunt, incenduntur om-" nia, tument, rubent et interno adore urun-" tur, ſecretioneſques largiores evadunt. Om-" nes hae calamitates anima intolerabili per-" cipit ratione moleſtiarumque ſolatia ex coitu " petit. Homo, fœcundis onuſtus humori-" bus, eos, ut ſe ipſam reproducat, circum " ſe ſpargere cogitur. Veneris ſervi labores, " ne negligantur, eo modo noſtræ œconomiæ " ſunt intexti ut dulcidine reficiat obedientes, " contumaces clandeſtino igne conficiat. His " accedit gratus in coitu ſenſus, quia conten-" tione omnium nervorum, convulſivo muſ-" culorum motu, calore per omne corpus " perfuſe et ſpeciali quorumdam nervorum

 " titilatione

" titilatione enaſcitur. Senſus eſt confuſus, a " mutata corporis conditione in anima ſuſci- " tatus cujus finem ſatis, ſed minus cauſas " proximiores perſpicimus."

CHAP-

CHAPTER IV.

ANALYSIS OF SENSATION CONTINUED.

ON THE IMPRESSIONS WHICH YIELD THE SENSATION OF CORPOREAL PLEASURE AND PAIN.

PLEASURE and pain, thoſe extremes of ſenſation, which ſeem ſo widely different from each other, but which in reality are very ſimilar, not only in their nature, but alſo in their cauſes, are terms often indiſcriminately applied to denote certain affections of our nerves, and certain emotions of our mind.

When a perſon cuts his finger, he is forced to acknowledge, and acknowledges with truth, that it is in the wounded part that he is pained. The affection of the nerve is communicated to the brain, and excites what is called

called a mental perception, that is, he becomes confcious of the injury received. But to fay, on this account, that it is the mind which fuffers, or, to ufe the common language of metaphyficians, who in general are extremely ignorant of the human frame, and fay, that all pain is only an affection of the mind, appears a moft unjuftifiable and unphilofophical expreffion; one might as well affert, that it is the mind which fmells, which fees, hears, taftes, and touches. The mind has no fuffering whatever from mere bodily pain, except that which it derives in an indirect manner from the reflection, that the bodily injury received may be followed by lamentable confequences. But fuch thoughts belong to the painful emotions of grief, and are quite diftinct from the phyfical derangement in the ftructure of the nerves, occafioned by their being forcibly divided.

If, from the peculiar organization of our frame, we are expofed to many caufes of painful feeling, we are indemnified, in a great degree, by the enjoyment which we derive from

the

the ſame ſource. Foſtering warmth gives a pleaſurable feeling to a perſon chilled with cold; the refreſhing breezes which ſucceed the heat of a ſcorching ſun, the ſweet ſcent of odoriferous plants, the gay and varied ſcenery of the Spring, the uſual gratifications of appetite, and the careſſes of love, are all proofs which ſupport the aſſertion.

It is not a valid argument againſt this opinion to ſay that ſuch corporeal feelings may be deſtroyed by mental cauſes; for inſtance, that a perſon by attending to any abſtract ſubject, or in conſequence of receiving any agreeable news, appears inſenſible to the pain of which he loudly complained only a few moments before. It will be proved hereafter, that all mental perceptions occaſion ſenſorial impreſſions, which correſpond with them in ſtrength and duration. But all ſenſorial impreſſions, whether derived from a mental or from an external cauſe, are to be conſidered as phyſical affections of nervous matter; and hence it happens that all ſtronger ones muſt neceſſarily impede the tranſmiſſion of weaker ones; the

ſenſorial

ſenſorial impreſſion, therefore, of joy, if it be ſtrong, counteracts thoſe from bodily pain, if theſe are not very violent.

When we inquire into the nature of the cauſes which produce bodily pain, we diſcover a great number, the primary action of which is obvious enough. They evidently derange the ſtructure of the nerves to which they are applied; thus, all bodies which cut, bruiſe, or lacerate, occaſion pain.

When, of a number of cauſes, all of which correſpond in producing a ſimilar event, the operation of ſome is once detected, it is natural for the human mind to imagine that all the others alſo act in a ſimilar manner. Many of the cauſes of corporeal pain act in a manner which cannot be detected by the evidence of our ſenſes; ſuch, for inſtance, as the ichor of certain ill conditioned ſores, certain concentrated acids, pure alkalies, many metallic oxyds, and metallic neutral ſalts; but as we know that all mechanical ſtimuli occaſion pain, by deranging the ſtructure of the nerves

themſelves,

themſelves, we are led to conclude, that all the others act in the ſame manner.

The nerves, like every other part of the human frame, are ſupplied with arteries and veins, and conſequently are ſubjected to all the diſeaſes which the irregular and inordinate action of theſe veſſels occaſion. Many cauſes of bodily pain produce their effects by exciting too great an action in theſe veſſels. In this way all bodies which are capable of exciting inflammation alſo excite pain. When ſpeaking of ſtimuli in the chapter on irritability, I endeavoured to prove that many of them produced their effect by altering the chemical texture of the part to which they were applied; and hence the reaſon why many bodies occaſion corporeal pain in a double way, that is, not only by directly changing the chemical conſtitution of the nerve, but alſo by cauſing ſuch an increaſed action of its veſſels, as greatly deranges its ſtructure. In this way all thoſe bodies act which we call *chemical ſtimuli.*

The

The affection of the nerves, then, which occasions in us the feeling of pain, is always to be considered as a physical derangement of its structure. If that derangement be only momentary, as happens in consequence of a slight blow, the pain is momentary; if it continues and spreads itself, as is the case when a caustic is applied, the pain is lasting. All corporeal pain, wherever situated, is to be accounted for on similar principles to those explained. There is, however, a passage in the Zoonomia, Vol. I. p. 243, which seems to stand in opposition to this opinion. It is in that part where its celebrated author endeavours to account for the manner in which wine and opium relieve pain. "In what "manner wine and opium act in relieving "pain, is another article that well deserves "our attention. There are many pains that "originate from *defect*, as well as from excess "of stimulus; of these are the six appetites "of hunger, thirst, lust, the want of heat, "of distention, and of fresh air. Thus if "our cutaneous capillaries cease to act from "the diminished stimulus of heat, when we "are

" are expofed to cold weather, or our ftomach " is uneafy for want of food; thefe are both " pains from defect of ftimulus, and in con- " fequence, opium, which ftimulates all the " moving fyftem into increafed action, muft " relieve them." Why Dr. DARWIN calls the " want of heat," and the " want of diftention" appetites, is left unexplained. In every fec- tion of his work the reader, who reflects, meets with conftant occafion to lament the fingular abufe of common terms which this author falls into; but a cavil about mere words is as foreign, here, to the point at iffue, as it is unneceffary to its elucidation. The queftion is this, whether the uneafy fenfations of hun- ger, cold, luft, &c. arife from the mere ab- fence of a ftimulus, as Dr. DARWIN thinks; or on the other hand, if they arife from the direct action of a ftimulus. Every circumftance feems to prove that the painful feeling of hun- ger arifes from the action of the gaftric fluid on the nerves of the ftomach: when any thing is taken into the ftomach on which this fluid can act chemically, and which at the fame time prevents it from being applied in a con-

centrated ſtate to the nerves of the ſtomach, the pain of hunger ceaſes, nor does the ſenſation again return until all the food has been nearly expelled, and the gaſtric fluid is again accumulated in an undiluted ſtate. This fluid is proved to be of an acid nature, and like all acids, it may produce pain upon chemical principles. In many caſes it is morbidly ſecreted in too great quantity, and probably alſo of a more acid nature than uſual, as appears to me to be the caſe with many young people, ſubject to acidity in the ſtomach; ſuch people have a painful ſenſation of hunger long before their ſtomach is empty. In ſuch patients, digeſtion goes on well for a certain time, and then the painful ſenſation, accompanied with hunger, ariſes, as if more food was required to dilute the preternatural quantity of acid in their ſtomach. If they obey the internal monitor, and eat frequently, they are always better than when they patiently ſuſtain the pain until the cuſtomary hours of taking food return. In every caſe, the painful ſenſation of hunger ſeems to ariſe, like all kinds of bodily pain, from the

direct

direct influence of a ſtimulus, and not from the defect of it, as Dr. DARWIN aſſerts. People who induce a torpor of the veſſels which ſecrete this fluid, as hard drinkers, ſeldom experience acute hunger ſo ſoon as thoſe who are in good health, and live temperately.

The pain of luſt, like the pain of hunger, ariſes from the action of a ſtimulating fluid, which, when it is accumulated to a certain quantity, is deſtined to produce an uneaſy feeling in the part where it is ſecreted. It ſeems to act chiefly as a mechanical ſtimulus, for the pain always increaſes as the epididemis becomes hard and diſtended. The French chemiſts ſay that it has an unpleaſant, acrid, pungent taſte, and therefore it may occaſion pain from its being poſſeſſed of ſuch qualities as give theſe painful ſenſations to the tongue. If any circumſtance prevents the ſecretion of this fluid, ſuch as ſevere and long continued exerciſe, and a poor and ſcanty diet, the perſon ſhall bear the abſence of Dr. DARWIN's ſtimulus with more pleaſure than pain.

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The pain of cold, which Dr. DARWIN afcribes to the defect of the ftimulus of heat, arifes from the compreffion which the delicate and pulpy extremities of the nerves of the fkin fuftain, when the parts fhrink by cold. But the contraction of the fkin is a mechanical ftimulus to thefe nerves, and this pain, therefore, cannot be faid to arife from a defect of ftimulus. Nor does any corporeal pain whatever arife in this way. In order to detect the ftimulus, however, which occafions it, we muft look a little further than to mere external caufes.

Many circumftances which produce bodily pain when they are diminifhed to a certain degree, excite the fenfation of bodily pleafure. A moderate degree of heat, and a moderate degree of light, a gentle degree of friction, a cool breeze, when the body is warm, all produce a pleafing fenfation; but if the light, heat, friction, and cold, be intenfe, the effect is painful, or unpleafant. A difh moderately warmed with fpices is pleafurable; a difh in which too much pepper is mixed, occafions a burning

burning pain. Since, then, the exciting causes of these two sensations differ from each other in degree only, it is natural to imagine that the affection of the nerves, which we call pleasure, differs from pain also in degree alone.

This idea is corroborated by investigation. All the causes of bodily pleasure and pain are direct stimuli; such, for instance, as heat, friction, light, well-prepared viands, wines, &c. The first effect which all these naturally produce, is to increase the action of every vessel of the part to which they are applied, and consequently of those which supply the nerves of the part. This increase of motion, or action, in the vessels of these delicate organs may, according as it is gentle or violent, be the immediate cause of the affections of the nerves, which we call pleasure or pain. The increased action of the blood-vessels of the part may also be productive of other effects, which likewise conspire to the production of pleasure or pain. I have said that a number of circumstances prove to us that there is a peculiar fluid secreted in the nerves. Like all secreted fluids, it must be changed by every alteration

in

in the action of the blood-vessels. If the action be only gently increased it will flow more copiously and easily; if the action be diminished, it will be slow. In the first case there is an indescribable state of bodily comfort, ease, or pleasure, which seems to pervade the whole frame; in the latter case there is a degree of nervous uneasiness, which occasions restlessness, and many painful nervous feelings.

The causes which produce the feeling of pleasure in our senses are numerous; they are either repetitions of moderate stimuli, which are of a similar nature, or else a succession of different stimuli which are applied with a gentle force. The first seldom occasion any exquisite feeling of pleasure, except to certain organs of touch. The latter are common to all the senses, touch excepted. All compound dishes yield, in general, more pleasure to the organ of taste than bread, or water, or any simple sapid body. The smell of one flower may certainly be grateful, but we are more delighted by fragrant odours which come

come in ſucceſſion from a number of ſweet ſcented plants, than by continuing to ſmell at one alone; a ſingle note of muſic often repeated is not pleaſurable to the ear, but a gradual ſucceſſion, and a juſt combination of notes, allied by muſical affinities, are agreeable.

In regard to the eye, which of all our ſenſes ſeems to be the moſt perfect, not only in regard to the fineneſs of the matter, the impreſſions of which it feels, but alſo in regard to the variety of objects, of which it conveys impreſſions to the mind, its pleaſures conſiſt either in certain varieties and aſſociations of colours, or in varieties of figure, or in the variations of the ſhades of light.

Inſtances of the pleaſure ariſing from bodies in conſequence of a variety in their colours, are to be met with frequently in the vegetable kingdom, eſpecially among flowers.

Objects which yield a pleaſing feeling to the ſame organ, on account of a gradual variation of

of form, affording ſucceſſive gradations of light and ſhade, are alſo common, and more admired, although mankind in general are not aware of the reaſon. We ſpeak, at preſent, of the elegant form of ſome of the animal kingdom, and more eſpecially of the human ſpecies. It is chiefly on this account that the eye finds a delight in viewing the ſtatue of a Venus, of an Apollo, or Antinous.

There is another object of beauty more common than theſe, the deſcription of which I take from an author of uncommon taſte and fancy, whoſe literary talents will make his death lamented as long as true genius is admired.

"Obſerve," ſays Mr. BURKE, "that part "of a beautiful woman, where ſhe is, perhaps, "the moſt beautiful, about the neck and "breaſt; the ſmoothneſs, the ſoftneſs, *the* "*inſenſible ſwell; the variety of the ſurface,* "*which is never for the ſmalleſt part the ſame,* "*the deceitful maze* through which the un-

" ſteady eye ſlides giddily, without knowing
" where to fix, or whither it is carried."

When pleaſurable ſtimuli are too long applied, they exhauſt the nervous principle, and diminiſh the irritability of the veſſels which ſecrete it. This phyſical derangement of the nerve occaſions pain. In ſuch inſtances, it is impoſſible to ſay where pleaſure ends and pain begins. A certain degree of titilation is agreeable, but if it be long continued it becomes an intolerable pain: the ſweeteſt muſic, and the moſt delightful aſſemblage of objects in a picture, after a certain time become tireſome, and at laſt painful. On the other hand, many ſtimuli which at firſt occaſion pain, ſoon after yield a ſenſation of pleaſure. This happens in conſequence of the irritability of the veſſels which ſecrete the nervous principle being ſo much exhauſted, that the fluid is afterwards but ſparingly ſecreted; and hence powerful ſtimuli are required to produce pleaſure.

The irritability of the veſſels ſecreting nervous fluid may only be exhauſted for a ſhort

 time;

time; and in ſuch caſes the ſtimulus that exhauſted them, if it be continued, will create pleaſure.

" An extraordinary young man who lived
" at Paris, and who was paſſionately fond of
" mechanics, ſhut himſelf up one evening in
" his apartment, and bound not only his breaſt
" and belly, but alſo his arms, legs, and
" thighs around with ropes, full of knots, the
" ends of which he faſtened to hooks in the
" wall. After having paſſed a conſiderable
" part of the night in this ſituation, he wiſhed
" to diſengage himſelf, but attempted it in
" vain. Some neighbouring females who had
" been early up, heard his cries, and calling
" the aſſiſtance of the patrole, they forced
" open the door of his apartment, where they
" found him ſwinging in the air, with only
" one arm extricated. He was immediately
" carried to the lieutenant general of the po-
" lice, for examination, where he declared
" that he had often put ſimilar trials into
" execution, as he experienced indeſcribable
" pleaſure in them. He confeſſed that at

"first he felt pain, but that after the cords "became tight to a certain degree, he was "soon rewarded by the most exquisite sensa- "tions of pleasure." *Gazette Literaire.*

Upon the same principle, and for the same reason, do all those arts depend, which are employed in the East Indies, China, and other warm climates, to awaken certain pleasant corporeal feelings, such as champooing, tickling the soles of the feet and the ears, &c.

When any pleasurable stimuli have exhausted the nervous principle to a certain extent, we become incapable of bearing the impressions any longer; we then say we are satiated with such a thing, and until the exhausted nerves regain the portion of the principle they lost, we have no desire to experience such feelings again.

It must occur to every reflecting mind, that if stimuli when applied to one part of our nervous system only were capable of exhausting the nervous principle equally from the whole of

of it, that the balance of human miſery would have been much greater than it really is; for the ſatiety ariſing from any one pleaſure, would have rendered us incapable of enjoying any others. But in this particular, as in all others reſpecting our wonderful œconomy, we have the moſt direct proof of the greateſt wiſdom and moſt benevolent foreſight having been beſtowed on our conſtruction. The diſtinct claſſes of nerves have each a certain quantity of the principle peculiar to them, which requires the repeated application of peculiar ſtimuli to be exhauſted; and hence, when one organ of ſenſe is fatigued, we are ſtill capable of receiving much pleaſure from the others.

When, from the repeated application of powerful ſtimuli, the nervous principle is habitually ſecreted in ſmall quantity, then in order to produce the ſenſation of pleaſure, it is neceſſary to apply ſuch ſtimuli as would occaſion pain in the generality of men. This habitual deficiency of the irritability in the veſſels which ſecrete the ſentient principle may be either partial, or general.

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As an inſtance of the firſt may be mentioned chewers of tobacco, takers of ſnuff, and people who have been accuſtomed to hot, ſtimulating diſhes. The quantity of tobacco uſed by the former, and the ſpices required by the latter, to produce a pleaſant ſenſation in the parts to which they are applied, would excite pain in one whoſe nerves of the noſe and mouth were in their natural healthy ſtate. Upon the ſame principle are to be explained a number of ſingularly vicious habits to which men, exhauſted by various exceſſes, and old age, are often addicted. " Nunc audiemus, Joan Picum. " Mirandulæ Comitem, qui ſæculo abhinc " uno ac dimidio vixit. Is Lib. iii. contra " aſtrologos, cap. xxvii. de familiari quodam " ſuo *vivit adhuc*, inquit, *homo mihi notus*, " *prodigioſæ libidinis et inauditae. Nam ad vene-* " *rem nunquam accenditur niſi vapulet. Et tamen* " *ſcelus id ita cogitat ; ſævientes ita plagas deſide-* " *rat ; ut increpet verberantem, ſi cum eo lentius* " *egeret, haud compos plenè voti, niſi eruperit* " *ſanguis, et innocentes artus hominis nocentiſſimi* " *violentior ſcutica deſævierit. Efflagitat miſer* " *hanc operam ſummis precibus ab eâ ſemper* " *feminâ*

" *feminâ quam adit, præbitque flagellum, sibi ad* " *id officii aceti infusione duratam, et supplex a* " *meretrice verberari postulat: a qua quantò* " *cæditur duriùs, eò ferventiùs incalescit, et* " *pari passu ad voluptatem doloremque conten-* " *dit.*" MEIBOMIUS (*de flagrorum usu in re venerea,*) *p.* 14.

CHAP-

CHAPTER V.

METHODICAL INQUIRY INTO THE NATURE AND PHYSICAL CAUSES OF DELIRIUM, PARTICULARLY THE DELIRIUM OF LUNATICS.

Evaluation of terms employed; difference between erroneous perceptions, and diseased notions; all men have some erroneous perceptions; the source of these described. The diseased notions of delirious people are of two kinds; their causes. History of maniacal phrenzy; appearances on dissection; new hypothesis concerning its causes. The nature of other maniacal deliria described and accounted for. Hereditary predisposition to insanity taken notice of; in what sense the expression is to be understood. Enumeration of the exciting causes of the various deliria described.

ALL delirious people, no matter whether they be maniacs, or hypochondriacs, or peo-

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ple in the delirium of fever, or of hyfteria, differ from thofe of a found mind in this refpect, that they have certain difeafed perceptions and notions in the reality of which they firmly believe, and which confequently become motives of many actions and expreffions which appear unreafonable to the reft of mankind.

The expreffion, *difeafed perceptions*, or *notions*, is here preferred to that of *falfe* or *erroneous perceptions* which is employed by other authors, *firft*, becaufe the ideas in all kinds of delirium whatever, arife from a difeafed ftate of the brain, or nerves, or both, as will be fatisfactorily proved in the courfe of this work; and, *fecondly*, becaufe the word *erroneous* does not defcribe any thing peculiar to delirium; for every man, however fane or wife he may be, has fome erroneous notions in which he firmly believes, and which often ferioufly affect his conduct. In the early periods of our lives, and long before we have been taught or accuftomed to think for ourfelves, we imitatively employ the language of our

our parents, nurfes, and thofe around us. From them we firft learn the names of many external objects, and of the various parts of our own frame, of many of our wants, and of the means of gratifying them. Our curiofity is excited by the fine fcenery of nature. We enquire what thefe things are which prefent themfelves to our fight, whence they come, and for what purpofe they are made; to all which queftions we receive fuch information as the knowledge and inclination to inftruct, of the perfon who anfwers them, are calculated to afford. Many of thefe anfwers are dictated by ignorance, many by a well-intentioned, but very injudicious defign to mifinform. Now, as by the natural condition of thought, words and ideas are affociated together, our mind foon becomes filled with a multitude of erroneous ideas, and loofe and inaccurate expreffions. How much are we furprized afterwards when a good and liberal education firft begins to deftroy the veil of ignorance in which we were enveloped, and fhews us the many grofs errors we formerly entertained? Even then, however, our progrefs in

truth

truth is but ſlow and limited; for the very beſt teachers have many prejudices, and many erroneous judgments, which they inſtil into our minds. We ſtrengthen ourſelves in error by our own preſumption; for we are willing to hazard opinions on various matters, before we are ſufficiently acquainted with the ſubject, and conſequently before we have clear ideas concerning it; and hence we acquire a falſe logic, to which, when once we become habituated, we find infinite difficulty in improving; and in many inſtances it is never afterwards corrected. If theſe obſervations are juſt, the aſſertion will be granted, that there is no man, however ſane, or wiſe, who may not be ſuppoſed to have ſome erroneous notions, in which he firmly believes, and which often influence his conduct.

The diſeaſed notions which delirious people entertain, are of two kinds:

1ſt. They are diſeaſed perceptions, referred by the patient to ſome object of external ſenſe; as when he believes he ſees, hears, taſtes, and ſmells things which have no real

exiſtence;

exiſtence; as when he imagines he ſees holes in the wall, through which monſters of various kinds appear in a menacing, or terrifying manner; or when he ſuppoſes himſelf ſurrounded by dangerous beaſts, and ſerpents.

2dly. They are diſeaſed abſtract notions, referrable to the qualities and conditions of perſons and things, and his relation to them; as when he imagines that his friends have conſpired to kill him; that he is reduced to beggary; that he is forſaken by God, &c.

Upon taking a general view of all the more evident exciting cauſes of delirium in general, without regard to their mode of action, it appears that they may, with much juſtice, be reduced under the three following heads.

1ſt. Phyſical, or corporeal cauſes; ſuch as too great determination of blood to the head, as in fevers, or intoxication, diſeaſed viſcera of the abdomen, poiſons, exceſſive diſcharges, &c.

2dly. Too

2dly. Too great, or too long continued exertion of the mental faculties, as in the delirium which often succeed long continued and abstract calculation; and the deliria to which men of genius are peculiarly subject.

3dly. Strong passions, such as anger, grief, pride, love, &c.

Now as there is no evident analogy between these three classes of causes, we are naturally at a loss to conceive how they should agree in their general effect of producing delirium. There must be some common principle, or principles, on which they all act, and by means of which they produce similar diseased phenomena, in the body and mind of many different men. This is the great object of inquiry, in the investigation of which, much patient attention, and an ample, scrupulous, and laborious examination of facts must be submitted to, if we expect to arrive at any useful conclusions.

The very ingenious and learned Dufours, in his excellent work, already mentioned, dedicates a whole chapter to prove that the diseases of the external senses, by giving rise to erroneous perceptions, produce aberration of reason. I presume to assert, on the other hand, that the diseases of the external senses do not of necessity produce any aberration of mind. This is a point which must be settled before we proceed a step further; for a great deal of mistake, in regard to the nature of delirium, appears to have arisen from this source. That diseases of the external senses produce erroneous mental perception, must be allowed; but it depends on the concurrence of other causes, whether any delirium follows.

As the arguments and reasoning of M. Dufours on this subject are confined within a narrow compass, I prefer giving a literal translation of the passages to making an extract from them. They are all comprehended in the four first paragraphs of the ninth chapter of his Treatise, and will, if properly considered,

dered, be regarded partly as a ſeries of aſſertions, partly as concluſions ariſing from falſe analogies.

"§. 114. That which we have now to "add, and the conſideration of all that has "been already ſaid in the hiſtory of ſenſa-"tions, enable us to point out the reaſons "why all men do not think alike on the ſame "ſubject; why they are not all equally capa-"ble of acquiring equal knowledge; why "ſome men ſhew a natural propenſity to one "thing rather than to another; why ſome "people eaſily conceive and execute what "to others is impracticable. From this it "will be further underſtood why ſome are "naturally active, lively, gay, and of a pene-"trating wit, while others are ſlow, ſluggiſh, "ſenſeleſs, and ſtupid; why ſome men are "immoveably attached to their own opinions, "and alſo what the cauſes are which induce "them to follow error rather than truth.

"§. 115. It will be eaſily ſeen from this "that we at preſent ſpeak of the forgetful-

"neſs

" ness and absence of melancholic people,
" &c. circumstances which are generally as-
" cribed to some fault of the internal senses,
" but which experience proves now and then
" to be false. I knew a countryman who lost
" his senses because he could not be persuaded
" that the objects he saw in consequence of an
" incipient cataract, arose intirely from that
" complaint. When he found that he could
" not remove the dark web which appeared
" to him to be constantly floating before
" his eyes, he fell into such frequent fits of
" violent passion that he became quite insane.
" But as soon as the disease was completed,
" he became more tractable and submitted to
" the operation like a reasonable man.

" §. 116. It is, moreover, natural to
" suppose, that the reflections of the mind,
" which in the most of cases have no other
" guide than the external senses, should be
" faulty and unreasonable, when the external
" senses, which heretofore served it faithfully,
" now go wrong without its knowledge. For
" the senses, in such cases, are like unfaithful

" ſervants, who do not perform their duty;
" and hence a great deal of confuſion and
" miſtake ariſes in the mind, from its not
" diſcovering a want of analogy between the
" effects of a new and unknown cauſe, and
" the former effects of well known and com-
" mon ones in which it confides.

" §. 117. The falſe impreſſions of the
" external ſenſes, then, muſt neceſſarily
" create diſorder and confuſion in a perſon's
" conduct; becauſe it happens moſt frequent-
" ly, that they determine his actions. A
" perſon truſts to his former experience,
" which has taught him that bodies are pre-
" ſent when they make an impreſſion on him.
" Hence many fallacies of the ſenſes, becauſe
" objects are the cauſes of his perceptions.
" Hence alſo it ariſes, that we often conſider
" things which are not preſent to our ſenſes,
" as preſent, and as the cauſes of our per-
" ceptions: or if there be any thing wanting
" in an external object, imagination ſupplies
" the loſs, and repreſents it as perfect."

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In very many inftances, the perfon is confcious of the error of the perception which is prefent in the mind; and in all fuch cafes, therefore, no delirium takes place. The lady of a very eminent furgeon, in town, had the mufcles of her eyes fo much weakened by the effects of an antimonial preparation which fhe had taken, that for fome months afterwards fhe could not direct them with the proper correfponding motions to the fame object. The confequence of this was a number of very ftrange illufions of fight. All objects were feen double, but not always in the fame relative fituations. Sometimes they appeared above each other, fometimes befide each other: yet no aberration of reafon followed. Do we not fee every day inftances of faulty vifion which give rife to very ftrange imaginary fights? as in incipient amaurofis and cataract, and yet no delirium or aberration of reafon arifes from them. M. Dufours, indeed, in the cafe related above, fuppofes the cataract gave rife to infanity; but the very recital of the cafe fhews that the mental derangement did not arife from the erroneous perceptions

 which

which the diſeaſe in the eyes gave birth to, but from anger, and fits of paſſion, which the perſon fell into from impatience.

In regard to the other external ſenſes, eſpecially *hearing* and *touch*, we find them often diſeaſed, and conſequently giving birth to various erroneous mental perceptions, and yet no delirium following. From which it may be concluded, that although one of the moſt conſtant phenomena of inſanity, and of all *deliria*, is erroneous perception, yet the cauſe or nature of the delirium is not to be ſought for in that circumſtance alone.

Theſe preliminary conſiderations being diſcuſſed, we are now prepared to enter into a regular inveſtigation of delirium. Of the remote, or exciting cauſes of this extraordinary ſtate of the mental faculties, ſome are very evident, others extremely obſcure. Of thoſe which are evident to our ſenſes, ſome are ſo conſtantly falling under our obſervation, that every perſon is able to narrate the ſymptoms which gradually occur, from the moment

moment they are firſt applied, until the diſorder is formed; the progreſſive effects of the others on the contrary, are not ſo eaſily traced. Among the more evident remote cauſes of delirium, the progreſſive effects of which can be eaſily traced, are, certain powerful ſtimuli, ſuch as ſpirits, wines, all ſtrong liquors, and opium. Thoſe which are evident, but the progreſſive effects of which are not ſo eaſily traced, are certain cauſes ariſing in many febrile diſeaſes. Of thoſe remote cauſes which are not only themſelves concealed from our ſenſes, but whoſe mode of operation is greatly obſcured, are to be reckoned all thoſe which proceed from hereditary diſpoſition to inſanity; and many other bodily cauſes of melancholy and hypochondriaſis.

Order evidently requires that we ſhould begin with thoſe whoſe mode of operation we can moſt eaſily trace, becauſe, if from ſuch an inquiry we arrive at any concluſions concerning their more immediate effects, ſuch concluſions will neceſſarily ſerve us

as the basis for conducting a comparative, or analogical process of reasoning for the rest. I shall therefore begin with the consideration of certain direct stimuli, as causes of delirium; and after taking a cursory view of that which happens in fevers, shall pass on to that of various kinds of insanity, not presuming to draw any general conclusions until all the facts shall have been narrated.

Intoxication, from wine, or spirits, or other powerful stimuli, such as æther, opium, &c. may be divided into three stages.

The *first* is that in which the person has several unnatural perceptions, his judgment, however, remaining still intire.

The *second* is a state of perfect delirium, in which he talks and acts unreasonably.

The *third* a state of coma, or apoplexy.

There is a certain point of intoxication, when a person sees the lights double, and yet has

has ſo much underſtanding as to know that it is a mere illuſion of ſight, proceeding from the wine or ſpirits he has drank. He has erroneous perceptions, and yet is not delirious: nay, it is by no means uncommon to ſee ſome young philoſophers, and ſtudents, who are accidentally in this ſtate, making the experiment of firſt ſhutting one eye, and then the other, with a view of diſcovering whether they ſee right or not. At ſuch a period a perſon is ſtill capable of conducting himſelf with tolerable propriety, although he generally loſes a little command over the muſcles of voluntary action. He gives a diſtinct and rational anſwer to any queſtion that is put to him, but it is not always very diſtinctly pronounced. If more ſtrong liquor be taken, a ſtate of real delirium enſues, in which the perſon talks idly, and unreaſonably; vociferates loudly; ſpeaks in broken and incoherent language; emits ſcreams, and ejaculations; laughs, and ſwears alternately, and has no command over his actions. If the debauch is continued, he at laſt falls from his chair in a ſtate which is called *dead drunk*, and which

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is a ſtate of real apoplexy; or if he has not taken ſo much as to induce this, the delirium terminates ſpontaneouſly in a profound and comatoſe ſleep, from which it is almoſt impoſſible to awaken him.

During the whole time that this ſcene is going on, there is a conſiderable degree of diſorder prevails in the heart and arteries, in which, indeed, the cauſe of the delirium has generally been ſought for. The circulation is much quicker, and ſtronger than uſual; the pulſe riſes both in force and velocity; the heat of the ſkin is increaſed; the face glows, the eyes become red and ſuffuſed, and a great determination of blood to the head evidently takes place.

It is well known that in many febrile diſeaſes, which are accompanied with ſtrong arterial action, as in pneumonia, acute rheumatiſm, phrenetis idiopathica, and meaſles, a delirium now and then occurs. This delirium is always attended by a number of ſymptoms, which are analogous to thoſe that ariſe

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the delirium of drunkenneſs; ſuch as a quick and ſtrong vibrating pulſe, increaſed heat of ſkin, thirſt, and reſtleſſneſs; a hot and glowing countenance, eyes vivid, ſparkling, and ſub-inflamed; and all the marks of great determination of the blood to the head. In this delirium, the perſon exhibits ſigns of uncommon muſcular ſtrength, and is agitated by violent paſſions; he requires the force of ſome men to keep him quiet, and his language is generally injurious, and expreſſive of pain, hatred, or anger.

One would be induced to conclude from all theſe obſervations, that a preternatural determination of blood to the head was ſufficient to produce delirium; and, therefore, that this might be conſidered as one of the more immediate cauſes of this diſordered ſtate of mind; but a little reflection ſoon forces us to a deeper reſearch. If a mere increaſe of circulation of the blood, through the veſſels of the head, be a cauſe of delirium, it ought to ariſe whenever that occurs; but this we know is not always the caſe; for a perſon ſhall have

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the blood preternaturally determined to the head by various kinds of exercife, and his pulfe beating 120 in a minute, and yet fhall have an underftanding as clear and unclouded as when his pulfe was at its natural ftandard. Befides, there are many inftances of people labouring under acute rheumatifm, and pneumonia, whofe pulfe beats 120 in a minute for feveral days, and yet have no delirium. From which it is evident that fomething elfe than mere increafed determination of blood to the head, and quicknefs of circulation, is neceffary to account for the production of the difeafe.

Before we hazard an opinion on this fubject, it ought to be remarked, that the delirium of many infane perfons is very fimilar, in all its mental characters, to that which has been defcribed; and its hiftory, therefore, by enlarging the field of facts before us, may throw fome light on the fubject of the proximate caufe. The peculiar delirium I allude to is called phrenzy, and is a ftate of mind into which not only the milder lunatics and maniacs,

maniacs, but melancholy people alſo are at times apt to fall.

The method which is adopted in this work demands a faithful account of all the phenomena which precede, accompany, and follow this kind of delirium, to be faithfully narrated, before any ſpeculative reaſoning is admitted.

Phrenzy comes on either very ſuddenly, or elſe it is preceded by a number of ſymptoms, which the experienced and obſerving phyſician immediately underſtands.

As an inſtance of the firſt kind, the following remarkable caſe may be adduced. " I. " H. G. a ſtudent of Belles Lettres, the ſon " of parents of a melancholic temperament, " was, in his early youth, of a calm and " tranquil character, appearing free from all " cares and uneaſineſs. Soon after he was " put to ſchool, he would, at times, ſpring " up ſuddenly, give a loud ſhriek, and run " up and down, ſpeaking to himſelf. After " this

" this he acquired a difguft for fcience, and " became quite melancholy. The following " Spring he was calm, but in the year 1765, " he at once was feized with phrenzy, and " was obliged to be brought to the work-" houfe. This was in the month of May, " and in the 23d year of his age, &c." GREDING, *on the ufe of White Hellebore.* See his *Vermifchte Schrifften*, p. 73.

This cafe is curious, from its having come on without any evident exciting caufe. For in the greater number of inftances in which phrenzy fuddenly occurs, fome evident exciting caufe is generally to be difcovered; fuch as certain paffions, pride, fuddenly created by fortuitous circumftances, anger, and grief, efpecially from difappointment, &c. Many phyfical caufes alfo bring it fuddenly on, fuch as too powerful ftimuli; for inftance, hard drinking, fevere exercife in hot weather, fudden tranfitions from heat to cold, and the fudden retention of habitual difcharges, &c.

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The duration and mode in which the diſeaſe terminates, is various according as the perſon is more or leſs prediſpoſed to the complaint, and according to the nature of the exciting cauſes.

It is of ſhorter duration, and more eaſily cured, *cæteris paribus*, in thoſe in whom it originates from accidental cauſes, ſuch as intoxication, ſudden tranſition from cold to heat, the retention of habitual diſcharges, &c. than in thoſe, who, like the ſtudent mentioned, have ſome diſeaſe gradually forming in their brain. That unfortunate young man continued delirious until the year 1771, when he cut his throat, and died.

The phenomena which announce the gradual approach of phrenzy, when its progreſs is ſlow, are ſo faithfully and well deſcribed by the late Dr. MONRO, in the ſenſible and elegant little eſſay which he wrote in anſwer to the wild romance of Dr. BATTIE, on the ſubject of inſanity, that I ſhall give the deſcription of them in his own words.

" *High*

" *High* ſpirits, as they are generally termed, " are the firſt ſymptoms of this kind of diſ- " order; theſe excite a man to take a larger " quantity of wine than uſual, (for thoſe who " have fallen under my obſervation in this " particular have been naturally very ſober,) " and the perſon thus afflicted, from being " abſtemious, reſerved, and modeſt, ſhall be- " come quite the contrary, drink freely, talk " boldly, obſcenely, ſwear, ſit up till mid- " night, ſleep little, riſe ſuddenly from bed, " go out a hunting, return again immediately, " ſet all his ſervants to work, and employ " five times the number that is neceſſary; in " ſhort, every thing he ſays, or does, betrays " the moſt violent agitation of mind, which " it is not in his own power to correct; and " yet in the midſt of all this hurry he will " not miſplace one word, or give the leaſt " reaſon for any one to think he imagines " things to exiſt that really do not, or that " they appear to him different from what " they do to other people. They who ſee " him but ſeldom, admire his vivacity, are " pleaſed with his ſallies of wit, and the ſaga-

" city

"city of his remarks; nay his own family "are with difficulty perſuaded to take proper "care of him, until it becomes abſolutely "neceſſary from the apparent ruin of his "health and fortune."

This is a true repreſentation of the gradual approach, not of inſanity in general, but of that peculiar kind which begins with high ſpirits; allowance at the ſame time being made for the ſituations of life in which the original was placed, from whom the Doctor has copied his picture. It is evidently taken from a man of fortune and of a good education, who has a family and ſervants at command. But thoſe who are in different ſituations in life, and thoſe of the oppoſite ſex, have their conduct marked by different circumſtances. The phenomena which are common to all, whatever their ſex, or ſituation in life may be, are theſe: high ſpirits, acute ſenſation, and great vivacity of thought, a diſpoſition to be eaſily and highly incenſed; or, on the other hand, to be thrown into extravagant laughter from ſlight cauſes; great phyſical

cal reſtleſſneſs, by which a perſon is prompted to take immoderate exerciſe, a ſtrong deſire for ſenſual pleaſures, by which they are prompted not only to go in ſearch of every amuſement, but alſo of every gratification they can procure, and which renders them totally regardleſs of their health and fortune; loquacity, and quickneſs of repartee, and conſtant agitation of the whole frame; theſe are ſymptoms which are general.

Such a perſon cannot be ſaid, as yet, to be delirious; but that event ſoon follows, and then he has the ſymptoms common to ſuch a diſeaſe; the only difference being that which ariſes from the thoughts which are repreſented in his mind. He begins to rave, and talk wildly, and incoherently; ſwears as if in the moſt violent rage, and then immediately after burſts into fits of laughter, talks obſcenely, directs offenſive and contemptuous language againſt his relations, and thoſe around him; ſpits at them; deſtroys every thing which comes in his way; emits loud and diſcordant ſcreams, and continues in this way

way till he is quite exhaufted. The ftate of reft which follows is generally fhort and fleepless; the patient is obftinate; will not fpeak one word, and clenches his teeth if any thing is offered him to fwallow, or elfe, with a degree of cunning, he pretends to drink a little, but immediately fquirts it out on the perfon who offered it. At once, however, he again breaks out into all the wild and extravagant language, and actions he committed before. If kept in ftrict coercion, he has often fo much command over himfelf as to behave mildly and modeftly, and were it not for the general expreffion of his countenance, and the peculiar gliftening appearance and rapid movements of his eye, he might impofe on many of the bye-ftanders, and make them imagine that the ftate of phrenzy was over.

This kind of furious paroxyfm continues for a longer or fhorter period of time in different cafes. In fome inftances, where there is but little predifpofition to the difeafe, and when it has arifen fuddenly from fome accidental exciting caufe, fuch as a long continued

 ftate

ſtate of intoxication, ſudden tranſitions from heat to cold, or *vice verſa*; or a violent fit of anger, or jealouſy, or deſpair, it is generally of ſhort duration, and eaſily cured. But when its approach is characterized by the ſymptoms narrated by Dr. MONRO, and ſeems to ſpring more from ſtrong hereditary prediſpoſition than from any evident exciting cauſe; its duration is generally much longer, and the prognoſtics, as to the ſtate in which it will leave the patient, always doubtful. It may continue a month, or two months, and upwards. It happens very ſeldom, however, that it is then characterized by ſo much violence as has juſt now been deſcribed.

Its termination is various. The moſt common is in a ſtate of tolerable mental and bodily health. Even thoſe who have a ſtrong hereditary taint often remain perfectly ſane for ſome years after the firſt attack. Thoſe in whom it has ariſen accidentally, from ſuch cauſes as have been lately mentioned, and who have no hereditary diſpoſition, may remain free from it during the reſt of their life. But

thoſe

thoſe in whoſe frame the prediſpoſition ſtill exiſts, are commonly again attacked with it ſome time afterwards. In ſome caſes it returns in the courſe of a few months. Theſe are generally hopeleſs caſes. In others the perſon may enjoy a ſtate of perfect ſanity for one, two, or more years, before any renewal of this melancholy diſorder takes place.

A phrenzy, however, is not always followed by longer or ſhorter periods of lucid reaſon. Of phrenitic patients, many remain completely maniacal for ſeveral months; others fall into a ſtate of deep melancholy; others into idiotiſm. The particular nature of each of theſe ſtates will be inquired into afterwards.

Upon inſpecting the bodies of thoſe who have died maniacal, or raving mad, a vaſt variety of diſeaſed appearances have been detected. Theſe are found to exiſt chiefly in the brain. Numerous are the caſes of diſſection which have been inſtituted on the dead bodies of maniacs. BONETUS, MORGAGNI, HERMAN BOERHAAVE, MECKEL, and a few

 others,

others, however, contain every fact of any importance on this fubject. Thofe who have written after their time, have only confirmed the truth of their teftimony. The difeafed appearances which have been detected within the heads of phrenitic patients, have alfo been found at times within the heads not only of idiots, and melancholy patients, but alfo within the heads of many others who never were infane during the whole period of their lives, but who had laboured under various nervous difeafes. If any one will take the trouble of confulting the hiftories of the diffections which MORGAGNI and BONETUS inftituted on patients who died lethargic, apoplectic, paralytic, epileptic; of thofe who had long fuffered under hyfteria, and thofe who died of fevers of various kinds, he will find an enumeration of all the difeafed appearances of the brain, and its membranes, which have yet been detected within the heads of lunatics, no matter whether phrenitic ones, or melancholic ones, or idiots. Dr. ARNOLD, with much patience and labour, has made a vaft collection of hiftories of diffections, an account

account of which is to be found in the ſecond volume of his work. GREDING alſo, in his miſcellaneous writings (Vermiſchte Schrifften) has alſo made a very extenſive and well arranged aſſemblage of facts drawn from reſpectable ſources. As this book is very ſcarce in this country, and as I cannot add any thing to what he has collected, and by copying from him might give myſelf an air of unmerited erudition; a literal tranſlation of this part of his work is inſerted in the Appendix, where it may be conſulted.

Let us now pauſe a little, and conſider all the facts that have been brought forward, and the deductions which may be drawn from them.

1ſt. We obſerve that a mere increaſed determination of blood to the head, provided the circulation be ſo free that a great congeſtion does not ariſe, is not the cauſe of delirium, ſince in the caſes of ſevere exerciſe, and in many fevers, where the pulſe beats 120 in a minute,

a minute, and the face is flushed and full, no such phenomenon takes place.

2dly. That an increased quantity of blood sent to the head, or the quickness with which it circulates there, are not the immediate causes of delirium, is further evinced by this fact, that the delirium of fevers, and many cases of phrenzy, begin when there is very little quickness of pulse, and often continue after that symptom is greatly subsided.

3dly. Dissections demonstrate in the clearest manner that although a vast variety of morbid appearances have been detected within the heads of delirious people, especially phrenitic patients, yet there is no one which has been uniformly present in all analogous cases; and therefore there is no reason to believe that any one of them is to be considered as the immediate cause of the alienation of mind, but rather as accidental effects, arising from various causes which have occurred either previous to the commencement of the disorder, or during its attack. Tumors of various kinds, ossifi-

cations

cations of arteries, and the membranes enveloping the brain, hydatids, ſtony concretions, increaſed vaſcularity, diminiſhed vaſcularity, coloured ſpots, increaſed denſity, increaſed ſpecific gravity; preternatural laxity, ulceration, ruptured veſſels, extravaſations of blood, lymph, and ſerum, not only on the ſurface, but in the cavities and in the ſubſtance of the brain; and independent of all theſe appearances, a vaſt variety in the form of the ſkull, has been detected in various caſes. The chief circumſtance, however, which proves that they are rather conſequences than cauſes of any particular diſeaſe, is, that they have been found not only in phrenitic patients, but alſo in idiots, melancholic patients, hyſterical ones, paralytic ones, and epileptic people.

4thly. In all caſes of that peculiar kind of delirium called phrenzy, the firſt phenomenon of diſeaſe appears to be a diſordered ſtate of ſenſorial feeling, if the expreſſion be permitted. All impreſſions on the brain are powerfully felt there. Thoſe derived from the external ſenſes, if they are calculated to excite

any

any desire, or passion, do so in a most uncommon degree; and the reaction of these mental impressions disorder the whole frame. The person acts as if from an involuntary impulse, which does not admit of the operations of reason. Hurry, uncommon strength, bustle, and violence, characterize all the actions and expressions of the patient; every thing creates an uncommon excitement of nervous energy in him.

We have had reason to believe that the medium, by means of which all impressions *ab externo*, are conveyed to the mind, and all those arising in the mind are communicated to the various parts of the body, is a peculiar fluid secreted, or at least formed in the medullary substance of the nerves. This reflection, and the previous conclusions drawn from the premises already laid down, naturally give rise to the conjecture, that the principal cause of such phrenzy and deliria as have been described, must be a peculiar morbid action of the vessels which secrete nervous matter, especially the fluid in question. It may be

altered

altered not only in quantity but quality. This idea is much ſtrengthened by the conſideration that the natural and healthy phenomena not only of the whole body, but of ſingle parts, and eſpecially all ſecreting organs, are much affected by diſeaſed vaſcular action. One ſet of ſymptoms proceed from the mere phyſical derangement which the uncommon action of the veſſels produces on the ſolid particles in their neighbourhood. Another ariſes from the changes in the fluids which circulate through them, and conſequently in the ſecretions they perform.

Although the force and quickneſs with which the heart and arteries act is extremely different in different individuals, and probably alſo in different parts of the ſame individual, it is a fair concluſion to ſay that there is a peculiar one which ſupports the healthy action of each individual. The expreſſion *diſeaſed*, or *morbid action*, is one by which is meant, in a general ſenſe, all deviations from this healthy action.

It

It is impoſſible for us to aſcertain either the peculiar nature or number of all the diſeaſed actions of which the vaſcular ſyſtem is ſuſceptible; far leſs thoſe which happen to the veſſels of particular parts in various diſeaſes. The difference that exiſts in the natural action of various parts, is by no means underſtood. Of morbidly increaſed arterial action, one kind is peculiar to gout, another to acute rheumatiſm, another to venereal inflammation, another to ſcrophulous inflammation, another to eryſipelas, &c. Now, although it is natural to ſuppoſe that in general the action of the remote branches of the arterial ſyſtem may be ſuppoſed to correſpond with that of the larger arteries, yet we have undoubted proof that this is not always the caſe. Their action is often altered in many very remarkable degrees, without any correſponding change of action in the heart, or ſyſtem of larger blood-veſſels. This is proved by caſes of topical inflammation of all kinds, in which the healthy appearances of the part affected are all changed, and yet the circulation in general goes on as uſual. It is alſo proved

proved by many diſeaſes of the ſkin, by ſecondary venereal ſores, ſcrophulous tumours, &c. In many caſes, indeed, of topical diſeaſed arterial action, the ſyſtem at large is deranged, but in ſuch caſes it is not owing to the diſeaſed action becoming general, but to a number of ſecondary cauſes; that is to ſay, the topical diſeaſe, produces a certain number of events; theſe become the cauſe of others, and theſe others of a third ſeries, and ſo on. Thus, certain diſeaſed actions of the veſſels of the liver not only produce uneaſineſs there, but alſo cauſe the bile to be much changed from its healthy ſtate, both in quantity and quality; and hence a certain number of morbid effects, pain in the ſtomach, nauſea, vomiting, faulty digeſtion, and loſs of appetite, colic pains, and violent purging. Theſe, if they continue for any length of time, produce headach, heat of ſkin, thirſt, great languor, and reſtleſſneſs, and at laſt cramps in the extremities, and convulſions, &c. So the diſeaſed action of the veſſels of the brain, which give riſe to phrenzy, operate in a ſimilar manner. An altered ſtate of feeling in

in the brain is evident in the quicknefs and vividnefs of the eyes, the irafcibility and the difordered ftate of the mental faculties; the patient's infenfibility to cold, and alfo his depraved appetite, &c. Thefe, if they continue, produce want of fleep, flight febrile paroxyfms, a furious and ungovernable conduct, wild and incoherent expreffions, and fo on.

But if the action of the veffels which fecrete the fentient principle, be greatly altered from their healthy ftate, the fine fluid which is fecreted muft undergo proportionate morbid changes. In order to prove the effect which any unufual change of the fluids has on the mental operations, I fhall infert a fingular fact, mentioned by Dionis in the 498th page of his *Cours d'Operationes de Chirurgie*. He fpeaks of a practice which was at one time attempted to be introduced, with a view not only of preventing, but curing many difeafes.

The fact he fpeaks of is the transfufion of blood from certain animals into man. The event,

event, however, was terrible; for a great number of thoſe on whom the experiments were made became furiouſly mad, and ſoon died. The parliament of Paris having gained intelligence of theſe experiments, iſſued a decree, by which it was forbidden, under the moſt ſevere penalties, to repeat ſuch experiments. His words are theſe: "Ils firent "plufieurs de ces operations qui devoient ſe-"lon eux, avoir un ſuccefs ſurprenant; maix "la fin funeſte de ces malheureuſes victimes "de la nouveauté detruiſit en un jour les "hautes idees qu'ils avoient conçues; ils de-"vinrent foux, furieux et moururent enſuite. "Le parlement informé de ce que s'etoit "paſſé interpoſa ſon autorité, et donna un "arrèt par lequel il etoit defendu ſous des ri-"goureuſes peines de faire cette opèration."

This fact is brought forward, not with a view of inſpiring the idea that the delirium of maniacs ariſes primarily from a vitiated ſtate of the fluids, but merely to prove that when the fluids are altered, no matter what the cauſe

caufe be, they always change the action of the vafcular fyftem.

Upon the whole, I conclude that the delirium of maniacs, when it has the peculiar character of that which has been defcribed, always arifes from a fpecific difeafed action of thofe fine veffels which fecrete the nervous fluid in the brain. This difeafed action appears to be one which, independent of its fpecific nature, by which it is diftinguifhed from common inflammation, or fcrophula, is a preternaturally increafed one; and this I think is proved by the quicknefs of the external fenfes, the irafcibility of mind, the heat of the fkin, the flufhed countenance, and uncommon energy of body which maniacs evince. This hypothefis explains the reafon alfo why it often has periodical exacerbations, and remiffions. They who believe that tumors, ulcers, and offifications of the brain, or increafed fpecific gravity, or increafed hardnefs of the fame, give birth to mania, muft neceffarily be at a lofs to explain why the delirium ever ceafes while fuch caufes exift;

exiſt; but if it ariſes from diſeaſed action, it muſt ceaſe, and may, or may not return, according as a variety of other circumſtances conſpire to its re-excitement.

All the phenomena of the phrenzy of maniacs are either diſeaſed feelings, or aberrations of the mental faculties.

That diſeaſed feelings ſhould ariſe from diſeaſed action of the arteries of the brain, or of the nervous ſyſtem, is eaſily underſtood, ſince in fact every change in the phyſical ſtate of the nerves produces of itſelf a diſeaſed ſenſation; and independent of this, it neceſſarily alters all impreſſions of external bodies which are tranſmitted through theſe parts.

Upon what general principle the aberration of the mental faculties is to be accounted for in ſuch caſes, by thoſe who believe the mind to be eſſentially diſtinct from the brain, will be ſhewn in the Chapter on Memory, in which this curious inquiry comes more naturally before us than at preſent.

The

The fine veſſels of the brain and nerves which ſecrete the fluid principle, on which ſenſation depends, muſt be ſubject to all the laws of irritability which regulate the action of the other veſſels of the human body. If they are capable of being excited into too great action, whether it be of a ſpecific kind or not, they are alſo ſubject to torpor after it.

But if the principle on which ſenſation depends be too ſcantily ſecreted, delirium may ariſe; for in this caſe impreſſions, *ab interno*, are weakened before they reach the mind, and conſequently thoſe which ſpring up there from the aſſociation of ideas, or which are excited by diſeaſed bodily feelings, acquire a diſproportionate vivacity; that is to ſay, without being ſtronger than they are in general, they appear more vivid, on account of the weakneſs of the impreſſions of external objects. The patient, therefore, naturally believes that they have a real exiſtence, and his diſcourſe and actions ſpring from this ſource.

In

In ſuch a delirium, attention is greatly and neceſſarily diminiſhed, and therefore the ideas are not ſo permanent as in maniacal phrenzy, where the patient is often agitated by one thought only for a conſiderable length of time; hence the images which preſent themſelves to the mind of thoſe who labour under this low kind of delirium, are often tranſitory, and their diſcourſe is conſequently very incoherent.

Such a low kind of delirium frequently occurs in all the varieties of *typhus*, and often alſo in conſequence of profuſe hæmorrhages, and diſcharges, when accompanied with a quick pulſe, and other ſymptoms of fever. The patient is naturally reſtleſs and unruly, becauſe his ideas prompt him to be ſo; his language is querulous, but not offenſive.

There is a low delirium which follows the ſtate of phrenzy in maniacs, that is nearly allied, in its mental character, to that which occurs in low fevers. But there is a very great difference between the two

patients in regard to other circumſtances. The maniac with low delirium can uſe immenſe muſcular force; the febrile patient, on the other hand, is incapable of uſing much exertion. In the febrile patient the irritability of the whole frame is exhauſted by the general quickneſs of circulation, and increaſe of heat, which accompanies the complaint from its beginning; but mania being a local diſeaſe, and not accompanied by any very uncommon quickneſs of pulſe, the irritability of the muſcles ſeems often to be preternaturally accumulated. Theſe maniacs are often ungovernable, except by means of coercion, but they are more eaſily reſtrained than thoſe who are in a ſtate of phrenzy. They are intractable, and neither liſten to intreaty or to menaces. Fear of corporal puniſhment, however, makes them obey. They willingly avoid the light, burying themſelves under the bed-clothes, or under the ſtraw of their cells. All external impreſſions are greatly weakened in them before they reach the brain; and hence ſuch patients are for the moſt part inſenſible to cold, for many of them will remain

almoſt completely naked during the ſeverity of the winter. They are totally regardleſs of decency and cleanlineſs, and from ſome ſtrange motive are often found rubbing themſelves all over with their excrement. The ſenſation of hunger and thirſt, like every other natural bodily feeling, is weak; and they therefore appear to have little appetite; but their power of concoction is ſeldom impaired, for, if they are made to eat, they ſeem to digeſt the food well. When their keepers, however, preſent it to them, his appearance and expreſſions deſtroy the feelings of hunger, and they therefore often obſtinately refuſe to take it; and yet when left alone, and the inſtinctive ſenſation of hunger returns, they will greedily devour their *fæces*.

What the nature of the ideas are which preſent themſelves to their mind, it is impoſſible to know; for although they generally mutter ſomething to themſelves, it is in ſo low a voice as not to be heard.

It appears to me that ſuch patients often experience bodily ſenſations which are ana-

logous to the impreſſions that excite the feeling of corporeal pain; for they now and then emit loud ſcreams and howlings, which are ſingularly expreſſive of great ſuffering.

The time that they are to remain in this peculiar kind of delirium can rarely be foretold with accuracy. In ſome patients it continues for many months, and after a longer or ſhorter period is always ſucceeded either by a gradual return of health, or by another paroxyſm of phrenzy, in which the patient talks loudly, and inceſſantly as formerly, and is alſo again agitated with freſh violence and fury. It is worthy of remark that thoſe who are moſt furious in the ſtate of phrenzy, are moſt ſullen, gloomy, and inſenſible in this ſecond ſtage of mania.

During the whole of this term the irritable organs perform their offices rightly. The heart and arteries, ſtomach and inteſtines, ureters and bladder, and all the vaſcular ſyſtem, are in a ſtate of good health.

There is a kind of mania which is quite diſtinct from any thing that has been yet deſcribed. Like phrenzy, it ſeems to ariſe from a ſpecific increaſed action of the veſſels which ſecrete the ſentient principle; but at the ſame time it ſeems to be a diſtinct kind of action. It is not of ſo violent a degree, and conſequently the paroxyſm generally continues longer, and is not ſucceeded by a great ſtate of torpor. It would appear as if the impreſſions which this diſeaſed action of the veſſels of the brain produces, were more analogous to thoſe of corporeal pleaſure than of pain, for the patients are all happy, gay, and cheerful. Although they are not inſenſible to external objects, their thoughts are generally more vivid than the impreſſion from theſe, and hence it ſeldom occurs that their attention can be fixed on external things for any length of time.

So far from being averſe to ſociety like the maniacs who were laſt deſcribed, they hate ſolitude. They are lively, active, and extremely loquacious; the women, eſpecially, talk

talk inceſſantly. They are fond of all ſtrong liquors, take ſnuff with avidity, and are very libidinous. The moſt modeſt young females who it might be ſuppoſed had never heard an improper or indecent expreſſion in their life, when unfortunately ſeized with this complaint ſeem ſuddenly to be inſpired with the ſentiments and dialect of a looſe libertine.

Good humour characterizes this inſanity, and hence the patients are in general very tractable.

The ideas which prevail moſt in their minds are various and whimſical. They belong to the pleaſurable paſſions, and are moſt commonly inſpired by vanity. The men are kings, emperors, popes, lords, and biſhops, or elſe men eminent for ſome great talent. Sometimes they are faithfully attached to the characters which they at firſt aſſume, and uniformly maintain it for a conſiderable length of time; but this is by no means generally the caſe. In the 8th Vol. of the Pſychological Magazine, the mental character of a young harmleſs

harmlefs lunatic of this clafs who became mad from difappointment in love is minutely defcribed. "He at one time imagined himfelf "a great general, and then he always appeared "armed, and decorated the outfide of his "habitation with a large flag, to fhow it was "the head quarters of the army. At another "time he was a monk, and then he ufed to "go about barefooted, and covered only "with a white cloak. As he is very con-"verfant in church hiftory, his imagination "often made him believe that he was John "the Baptift, or the apoftle Peter, &c."

Women are almoft uniformly ladies of diftinction and fafhion, and feldom forget to decorate themfelves with every thing which they confider to be an ornament, and to exact or folicit attention.

This very peculiar kind of delirium is often of long duration. Now and then it is fucceeded by lucid intervals; now and then, though rarely, by phrenzy.

The

The diſeaſed action of the veſſels of the brain which occaſions that kind of delirium which is called lunacy, or inſanity, may ariſe from various cauſes.

Before we enumerate the exciting cauſes, it is neceſſary to ſay ſomething concerning the prediſpoſition to this melancholy diſorder.

Every medical man poſſeſſed of a moderate ſhare of experience, muſt have obſerved that the children of thoſe who have been inſane are more liable to attacks of delirium, and alienation of mind, than the deſcendants of other people; inſomuch that where a numerous family has ſprung from parents who are tainted, it rarely happens that inſanity is not produced in ſome of that family during part of their lives, by any ſlight exciting cauſes. If they marry and beget children the ſame thing is alſo obſerved among them. This fact makes us conclude that many have an hereditary right, or in other words are born with a prediſpoſition to the complaint.

When

When a phyſician ſays that a perſon has an hereditary right to a complaint, he does not mean that that perſon ſhall infallibly be ſeized with it in the courſe of his life. He may eſcape having it if he is ſo fortunate as to eſcape being expoſed to all the cauſes which are neceſſary to excite the morbid action of the veſſels of the brain in which it conſiſts. All that is to be underſtood by the term is, that ſuch a perſon is much more liable to have the diſeaſe than a perſon who is not born of tainted parents. Cauſes which will not produce any mental diſorder whatever in the one, are quite ſufficient to bring it on in the other.

That children often inherit the caſt of features, the form of perſon, the tone of voice, the temperament, and mental character of their parents, are eſtabliſhed truths. Since this is the caſe, therefore, it does not ſurely require any uncommon ſtretch of genius to ſuppoſe, that the internal viſcera of a child, ſuch as the ſtomach and inteſtines, kidneys, bladder, liver, brain, and alſo the more minute parts of its frame, ſhould alſo partake of the ſame inheritance; and that

that a child, therefore, ſhould often reſemble its father or mother, or have a joint reſemblance to both, as much in the ſecret organization of its frame as in its external character. Such a conformation entitles a child to a ſimilarity of diſeaſes or unhealthy actions as thoſe to which its parents were ſubject, provided it be expoſed to the common exciting cauſes of ſuch complaints: and hence we find that the children of gouty, rickety, ſcrophulous, conſumptive, and inſane people, are more diſpoſed to be affected with gout, rickets, ſcrophula, conſumption, and inſanity, than the children of healthy parents. That people were diſpoſed to certain diſeaſes from birth as well as from the operation of accidental cauſes, was an obſervation, or a mere matter of fact which was taken notice of by the Greek phyſicians, who denominated this cauſe of diſeaſe προηγουμενη; but a certain inaccuracy of expreſſion, in regard to prediſpoſition, has introduced itſelf into the writings of many medical men ſince theſe early times, and has induced them to call certain diſeaſes *hereditary diſeaſes*. This inaccuracy has probably been cauſed by

the conſtancy with which the influence of hereditary diſpoſition operates; but it gave occaſion to the late Mr. JOHN HUNTER to ridicule the expreſſion, and to aſſume the old obſervation of the Greeks, as one of his own diſcoveries; and many of his pupils, who have very few of his eminent qualities, but who imitate him in ſelf-eſteeem, have endeavoured to confirm this victory over modern phyſicians, by aſcribing the merit of the obſervation to him, and by their praiſes in its favour.

People who have no hereditary taint may at once become inſane if the exciting cauſes are powerful; but it is alſo to be remarked, that a prediſpoſition may be formed in ſuch as have no hereditary taint, by the continued operation of a number of cauſes. It is a certain fact, for inſtance, that men who have ſuſtained certain injuries on the head, and people who drink hard, are very apt to become delirious. It is alſo greatly to be ſuſpected that after a perſon has once been attacked with a real phrenzy, that the texture of the brain, and the natural arrangement of its veſſels, are thereby altered from

from their healthy ſtate, and that the morbid organic effects which follow, greatly prediſpoſe a perſon to the renewal of the complaint.

The unuſual hardneſs, ſpecific gravity, dryneſs, and toughneſs of the brain, and the various tumors, corroſions, enlargements of particular parts, oſſifications, and adheſions of the membranes, &c. are often the conſequence of the morbid action of inſanity; but while they are thus to be conſidered as mere effects, they are alſo to be looked on as cauſes which, by conſtant irritation, prediſpoſe the veſſels of the brain to the renewal of the delirium. Another claſs of cauſes which greatly prediſpoſe a perſon to diſorders of the mind, are various kinds of debility, ſuch, for inſtance, as ariſe from poor diet, bad drink, ſcrophula, over-fatigue of body, exceſs of venery, ſelf-pollution, exceſſive hæmorrhages, and exceſſive diſcharges.

The exciting cauſes of the various deliria which are conſidered as caſes of inſanity, are very numerous.

They are either,

I. *Pow-*

I. *Powerful Stimuli.*

A. Exceſſive heat, eſpecially the too long continued action of the rays of the ſun on the head.

B. Immoderate exerciſe, eſpecially in hot weather.

C. Sudden tranſitions from cold to heat, by which the irritability of the veſſels of the brain, like thoſe of the whole body, is firſt accumulated, and then violently excited.

D. Sudden tranſitions from heat to cold, by which a preternatural quantity of blood is thrown into the head, and acting as a violent mechanical ſtimulus.

E. Over-exerciſe of the mental faculties.

F. The paſſions, when violent.

G. Powerful ſtimuli applied to the ſtomach, ſuch as

1. Wine,

1. Wine, ſpirits, and all ſtrong liquors:

2. Opium, and other powerful narcotics, as they are commonly called.

3. Cantharides, and other aphrodiſiacs.

H. The tranſlation of various inflammations, and other diſeaſed actions to the brain, particularly thoſe which conſtitute and accompany cutaneous diſorders.

II. *Diſeaſed nervous impreſſions, conveyed from diſtant parts of the ſyſtem to the brain.*

Theſe diſeaſed nervous impreſſions may either be diſeaſed actions of the parts themſelves, or they may ariſe from irritating bodies applied to them.

It is impoſſible to reduce theſe under the form of a table, for in fact they may occur in any part of our frame. A delirium ſimilar to lunacy has been known to ariſe from a ſprain, from a fractured bone, from a bullet having been lodged among the external muſcles of the body, as well as from worms in the inteſtines;

tines; from ulcers in the uterus, and from various diseases of the viscera of the abdomen.

The first class of causes may be considered as being more particularly the exciting causes of pure insanity.

The second class of causes, especially those arising from diseases in the stomach and intestines, give rise to the temporary delusions which are peculiar to hypochondriacs. The history of this complaint, therefore, properly belongs to this place.

CHAPTER VI.

INQUIRY CONTINUED.

OF DELIRIA FROM MORBID NERVOUS IMPRESSIONS. THE HISTORY OF HYPOCHONDRIACS.

THE progreſs of hypochondriaſis is ſlow, and inſidious. Long before any alienation of reaſon takes place, a number of ſymptoms, evincing a deranged ſtate of bodily health occur; and if theſe are alleviated, or removed in time, no deluſion follows: from which it appears that the diſeaſe is not primarily ſeated in the brain. The viſcera of the abdomen appear to be the moſt common ſource of this melancholy diſorder, as appears from its hiſtory. It is by no means eaſy to diſcover which of them is chiefly in fault, in any particular caſe; far leſs can we diſcover what the peculiar nature of that faulty ſtate is. Moſt of

of the ſymptoms indicate a diſordered ſtate of ſtomach and inteſtines; but the functions of theſe organs are affected by ſuch a multiplicity of morbid cauſes, and in ſuch a variety of ways, that this only increaſes the obſcurity that ſurrounds us in our inquiry. The perſon is for many years troubled with flatulency, irregularity in the alvine diſcharge, and faulty digeſtion. Some have acidity in the ſtomach, others have a feeling there which makes them imagine the food to be converted into an oily or rancid kind of fluid. Such patients generally inform their medical attendant, that the contents of their ſtomach give them the idea of a pot of fat, boiling, or fermenting. The air which is evolved in the ſtomach produces great diſtention of that organ, and this diſtention is always accompanied by an uneaſy feeling, and ſenſe of anxiety. The patients are, for the moſt part, of a coſtive habit; now and then they are ſeized with a ſudden diarrhœa. It is, however, ſeldom critical, or ſerviceable. It exhauſts the ſtrength of the patient, leaves him low and dejected, and is

frequently accompanied and followed by irregular ſpaſmodic contractions of the muſcles of the abdomen, which MANDEVILLE makes his patient, MISOMEDOM, deſcribe as "tenſions, ſnatchings, thumpings, and pulſations in the belly."

Hypochondriacs are ſometimes affected with a bilious diarrhœa. They are very ſubject to the hæmorrhoids, from which they often loſe great quantities of blood. The flatulency with which they are now and then greatly tormented, is at times diſengaged from the ill-digeſted food; at other moments it ſeems to be ſecreted from the inner ſurface of the ſtomach itſelf. That which affects the inteſtines produces borborygmi, colic pains, and, frequently, occaſions a number of curious ſympathetic affections, ſuch as ſlight convulſions, and ſubſultus tendinum, eſpecially of the abdominal muſcles. Theſe circumſtances are often the ſources from which the diſeaſed perceptions of the patient ariſe. The noiſe which the air

makes in the inteſtines, and the ſubſultus tendinum of the muſcles of the abdomen, give birth to the idea that ſome living animal is within them, or that they are poſſeſſed of evil ſpirits. PLATERUS, Vol. I. . i. p. 43, relates the caſe of a young phyſician, who firmly believed he had living frogs within him. I myſelf knew a female hypochondriac who believed ſhe had a whole regiment of ſoldiers within her; and THOMAS BARTHOLINI, in his *Hiſt. Anat. Rar.* mentions the caſe of a ſtudent of divinity, who miſtook the noiſe of flatulency with which he was troubled, for an evil ſpirit who infeſted him.

Hypochondriacs often void a wheyiſh, or milky-white coloured urine, which always announces a great weakneſs and diſorder in the chylopoetic viſcera. At other times they make great quantities of a pale-coloured, and limpid urine. This generally occurs upon any agitation of mind, or hurry of ſpirits. Cold ſweats, which alternate with fluſhes of heat, eſpecially in the face and hands; the globus

hyſtericus, and fainting; dizzineſs, deafneſs, tinnitus aurium, and ſleepleſs nights, are frequently met with in the advanced ſtages of the diſorder. The patient generally feels a much more oppreſſive ſenſation of weakneſs and fatigue than is natural, conſidering the muſcular ſtrength he is capable of exerting. Certain ſymptoms of debility, which in another perſon would hardly produce any diſagreeable effect, for inſtance, ſudden diſtention of the ſtomach, ſlight palpitation, or colic, inſtantly occaſion all the alarming feelings of fear and apprehenſion, and theſe are accompanied with a degree of anxiety which cannot be deſcribed.

That ſome people are more diſpoſed to hypochondriaſis than others, is a fact which is proved by daily experience. It appears that the principal ſeat of the prediſpoſition is to be ſought for, not only in weak organs of digeſtion, but alſo in a preternatural nervous ſenſibility; for we often meet with caſes of dyſpepſia, and diſordered ſtomach and bowels, which have continued with a patient for many

many years, and yet no real hypochondriaſis follows. I know ſeveral people who have laboured upwards of twenty years under ſtomachic complaints of various kinds, and who notwithſtanding have never had any hypochondriacal ſymptoms.

Theſe facts give riſe to the conjecture that there muſt be other diſeaſed actions going forward in hypochondriacs, than thoſe which occur in the viſcera of the abdomen; and this conjecture is confirmed by a great number of phenomena which are conſtantly to be obſerved in ſuch people. They have many painful feelings in parts where no diſeaſe apparently exiſts, and they have many diſeaſed perceptions which command their belief, and greatly add to the general ſum of their miſery.

A number of the moſt diſtreſſing feelings which hypochondriacs complain of, are often external pains, ſeated immediately under the ſkin, and in parts which, when examined, appear to be in a ſound ſtate. Sometimes the pain is in the middle of one or two of the

the ribs, ſometimes in the middle of the leg, thigh, or arm, ſometimes in the back, and alſo in various parts of the head.

These painful feelings are generally tranſmitted from impreſſions in the ſtomach and inteſtines. But their being tranſmitted in ſuch an unnatural way, proves a very diſordered ſtate of the nerves. They are moſt frequent when the patient is troubled with indigeſtion, flatulency, coſtiveneſs, or colic; and what is very remarkable, the external pain is often increaſed by preſſure. I have, at preſent, a gentleman under my care, who is alſo attended by my friend, Mr. Lynn, who ſuffers exceedingly from theſe falſe pains. If the finger is preſſed upon the part it generally brings on ſpaſms in the organs of reſpiration, and occaſions ſo much agony, as to make him ſcream aloud; after the preſſure is taken away the pain ceaſes. Theſe pains are conſtantly ſhifting their place, and often wander over half of the patient's body in the courſe of the day.

The

The mental character of hypochondriasis consists principally in great dejection of spirits, inability of attending to worldly affairs, a constant anxiety about their own health, and an unremitting attention to every new sensation. After a certain time, which is longer or shorter, according to a great variety of circumstances, diseased perceptions suddenly arise. These either relate to the state of the patient's body, or mind, or else to their property, or, lastly, to certain people, or various external objects.

To attempt an enumeration of all the extravagant ideas which enter into the minds of such people would be fruitless, since they are as various as every unnatural combination of natural ideas can be. Some who belong to the first class think their extremities and posteriors are made of glass, others that their legs are soft as wax; some think they have no heart, others that they have no soul, others fancy they are dead, and others that they are changed to monsters; the pains of poverty, the persecution of enemies, the effects of secret

ſecret vengeance, and of calumny, are all common ideas with hypochondriacs, eſpecially if there be a little mixture of true melancholy with it, which is often the caſe.

It appears to me that very little good, in regard to practice, is likely to reſult from confining our obſervations to the nature of the erroneous ideas which infeſt the minds of ſuch people, except, inaſmuch as ſome of them, now and then, throw a little light on the firſt cauſe of the diſeaſe.

In order to make this aſſertion intelligable, it is neceſſary to obſerve, that, although hypochondriaſis may be juſtly ſaid to ariſe from a diſordered ſtate of the viſcera of the abdomen, yet it is alſo often brought on by affections of the mind, ſuch as deep and long continued grief, and melancholy. Theſe mental affections produce hypochondriaſis by creating a diſorder in the ſtomach and inteſtines, and in the nervous ſyſtem; ſo that in every inſtance it ariſes either directly or indirectly from this ſource. According as it happens

happens in one or other of theſe ways, the diſeaſe aſſumes a ſlight variation of mental character; but as this is merely accidental, it makes no eſſential difference in regard to the real nature of the complaint.

When hypochondriaſis ariſes primarily from diſeaſed viſcera, the erroneous ideas which preſent themſelves to the mind generally concern their own frame; but when it has primarily ariſen from melancholia, then the morbid ideas are for the moſt part unnatural, or at leaſt unreaſonable fancies either concerning other people, or their own worldly affairs; for the paſſions which give birth to and accompany melancholy, are commonly the moſt prevalent in their mind. When melancholy is deſcribed, which cannot be until mental pain and grief ſhall firſt have been treated of, this obſervation will then appear in a more ſtriking point of view.

Nothing can be more intereſting to a phyſician who is endowed with only a moderate ſhare of the ſpirit of obſervation, than the progreſs

greſs of this complaint in a number of patients, eſpecially in regard to its effects on the mind. They always ſtruggle, more or leſs, in the beginning, with the lowneſs and dejection which affect them; and it is not until many a ſevere conteſt has taken place between their natural good ſenſe, and the involuntary ſuggeſtions which ariſe from the obſcure and painful feelings of their diſeaſed nerves, that a firm belief in the reality of ſuch thoughts gains a full conqueſt over their judgment. A firm belief in any perception never takes place until it has acquired a certain degree of force; and as all impreſſions which ariſe from the viſcera of the abdomen are naturally obſcure, we ſee the reaſon why theſe muſt continue for a great length of time, or be often repeated before they can withdraw a perſon's attention from the ordinary impreſſions of external objects, which are clear and diſtinct, and before they acquire ſuch a degree of vividneſs as to deſtroy the operations of reaſon.

We meet every day with hypochondriacs, in whom the diſeaſe is juſt beginning to be formed,

formed, and who being poſſeſſed with the remains of a good underſtanding, ſeem unwilling to tell, even to their medical friends, the ſingular and often melancholy thoughts with which they are tormented. They acknowledge them to be unreaſonable, and yet inſiſt on it they cannot help believing in them. A very curious diſplay of this kind of ſtruggle, between the habitudes of reaſon, and the approach of delirium, is to be met with in the diary of an hypochondriac; various extracts from which were ſent to the editors of the Pſychological Magazine, and are publiſhed in the 8th Vol. part 2d, p. 2, of their work. Some of theſe are ſo remarkable, that it is hoped they will not prove unintereſting to the reader.

" On the 14th of November, the idea that " ſome perſon intended to kill me, ſprang up " ſuddenly and involuntarily in my mind, and " yet, I muſt confeſs, there was no reaſon " why I ſhould have harboured this thought, " for I am convinced no one ever formed ſuch " a cruel deſign againſt me. People who had

" a ſtick

"a ſtick in their hands, I looked on as mur-
"derers. As I was walking out of the town,
"a countryman happened to follow me, and I
"was inſtantly filled with the greateſt appre-
"henſion, and ſtood ſtill to let him paſs. I
"aſked the fellow in a threatening voice,
"and with a view of intimidating him from
"his purpoſe, what was the name of the
"town before us. The man anſwered my
"queſtion, and walked on, and I found great
"relief, becauſe he was no longer behind me.

"In the evening I obſerved ſome water in
"the glaſs out of which I commonly drink,
"and I inſtantly believed it was poiſoned. I
"therefore waſhed it carefully out, and yet
"I knew at the ſame time, that I myſelf had
"left the water in it.

"18th Nov. The effects of the nuptial
"embrace on my mind, gradually grow
"more ſingular, inſupportable, and dan-
"gerous. It is not that I find myſelf weak-
"ened by it, on the contrary, I always feel
"myſelf, at firſt, lighter, more cheerful, and
"better

"better diſpoſed for ſcientific inquiry. I "alſo obſerve, that at ſuch times I have much "happier and wittier thoughts than at any "other; but, alas! this ſtate of mind and "body does not continue long. For ſuch "moments of connubial tenderneſs I after-"wards pay dearly, by long-lived days of "mental inquietude. I am then dreadfully "out of humour, and believe that all man-"kind have conſpired to murder me. I "think I am deprived of my office, that I "am doomed to die for hunger, and to add "to all this, I am tormented with horrid "doubts concerning futurity, and theſe "thoughts perſecute me like furies. Thoſe "whom I was wont to love moſt, I now "hate: I avoid my beſt friends, and my dear "wife appears to me a much worſe kind of "woman than ſhe really is.

"I cannot deſcribe the exertion it re-"quires to conquer, in ſociety, the averſion "I feel to my fellow creatures; and to pre-"vent my ill humour from breaking out "againſt the moſt innocent people. When

"it

" it really does ſo, I ſpare no one; I am ſorry " for it afterwards, but then I am too proud " to acknowledge my error.

" I find myſelf ſo enraged on ſeeing a " ſtupid, vacant countenance, that I have an " almoſt irreſiſtible inclination to box the " perſon's ears to whom it belongs; the re- " fraining from it is a ſevere effort.

" 20th Nov. A boy with a face like a " ſatyr met me, and occaſioned me the great- " eſt uneaſineſs. Although he did nothing " to diſpleaſe me, I was forced to go to him, " and tell him that I was ſure he would die " on the gallows.

" 23d Nov. My ſenſibility is often ex- " treme, and then my beſt friends become " inſupportable to me. To their expreſſions " of regard I am either purpoſely cold, or " elſe I anſwer them by rude and offenſive " ſpeeches. I can ſeldom explain to myſelf " the reaſon of this too great ſenſibility. If " two people whiſper each other in my pre-

" ſence,

" ſence, I grow uneaſy, and loſe all command " of mind, becauſe I think they are ſpeaking " ill of me; and I often aſſume a ſatirical " manner in company, in order to frighten " them. Anxiety, dreadful anxiety, ſeizes " me if a perſon overlooks my hand at cards, " or if a perſon ſits down beſide me when I " am playing the harpſichord, &c."

This hiſtory proves, in a very convincing manner, the truth of the obſervation, that the perſon often ſtruggles, as it were, with the diſeaſe of his mind, until it at laſt gains ſuch an aſcendancy over him as totally to overthrow his reaſon. Nor is this to be wondered at; for as ſoon as the faculty of reſtraining ones thoughts, and of attending to the compariſons which the power of reaſon employs, is greatly weakened, the ſuggeſtions which are excited in the mind by the diſeaſed feelings, muſt neceſſarily be believed in.

The circumſtance which appears the moſt unaccountable to people who have not thought deeply on the ſubject, is the fact, that the ſource

ſource of the illuſion generally lies in the abdomen. Some light may be thrown on this at preſent, but it is probable that it can only be rendered perfectly clear by an attentive peruſal of the ſucceeding parts of the work, in which many analogous facts are explained.

Moſt of the objects which ſurround us have been examined by ſeveral of our ſenſes; we have compared the various ſenſations they have yielded and theſe, therefore, become aſſociated in our mind, ſo that if any external body thus examined, be again preſented to only one of our ſenſes, the idea of all its various qualities is recalled, and we neceſſarily believe in their reality. The ſources of almoſt all our perceptions, while we are in health, lie in external objects; for the nerves of the external ſenſes are the only ones of our whole frame which convey clear impreſſions to the intellectual part. Hence we acquire a natural habit of aſcribing all ſtrong impreſſions to ſome external cauſe. In caſes, therefore, where the cauſe of the ſenſation cannot be examined,

examined, a falſe judgment may eaſily ariſe. The languor and pain, and various uneaſy ſenſations which a hypochondriac feels, naturally withdraw his attention from ſurrounding objects, and as the exerciſe of his judgment is weakened by the ſame circumſtances, he does not examine the unreaſonable ideas with accuracy when they are firſt preſented to his mind. Painful feelings are aſſociated with melancholy thoughts; and new and uncommon feelings, upon the ſame principle, are aſcribed to ſtrange and uncommon cauſes. The weakneſs, therefore, which a hypochondriac feels in his limbs makes him imagine they are unable to ſupport him; but if they cannot do ſo, he concludes they muſt bend or break: the idea of fragility, or flexibility, however, is often derived from ſuch ſubſtances as wax, and glaſs, and he therefore, believes that his limbs are made of ſome kind of ſimilar materials.

" A painter of conſiderable reputation in
" his art, imagined that all his bones were
" become ſo ſoft and pliant that they muſt

 " neceſſarily

" neceſſarily bend like wax, if he attempted " to walk, or if any hard body was ſtruck " againſt them. In conformity with the fears " which ſuch a notion inſpired, he kept his " bed during the whole winter, imagining " that if he aroſe, his legs would be com- " preſſed by his own weight into a lump like " clay, or wax." *Tulpius*. (Obſ. Med. Lib. i. cap. 18.)

" A baker, of Ferrara, believed he was " made of butter, and on that account would " not approach the oven leſt he ſhould " melt." *Marcus Donatus*. (Hiſt. Med. Rar. Lib. ii. cap. 1.)

Dejection of mind, and melancholy, beget fear and apprehenſion, and the emotion of theſe paſſions being aſſociated with horrid thoughts, the fancy is crouded with pictures of impending danger, for the feelings he experiences are exactly ſimilar to thoſe he has formerly felt from fear or terror. As to the cauſes which induce him to think that the danger is threatened by one perſon, or

by

by ſome perſons rather than by others; or which make him imagine that it ariſes from a ſuppoſed ruined ſtate of his fortune, rather than from any other ſource, they are often of ſuch a trifling nature as to eſcape common obſervation; a look, an unguarded expreſſion, over-ſtrained, or officious attention to his wants, inattention and diſregard of his wants, a change in the mode in which his buſineſs is conducted, &c. are all ſufficient to give birth to ſuch conceits, while he is affected with languor, weakneſs, and diſeaſed feelings.

The ſingular notions which hypochondriacs entertain, may now and then be eradicated from their mind by means of a little art; but there is ſeldom any real good to be derived from this, except the diſeaſe be at the ſame time cured; for if diſeaſed impreſſions continue to ariſe in the mind from the diſordered viſcera, other illuſive notions will ſpring up as ſoon as one ſet is deſtroyed.

" The wife of one SALOMON GALMUS
" imagined there was a living monſter within

 " her,

"her, which inhabited certain parts which "are peculiar to her ſex. Of this conceit "ſhe was cured by the cunning and dexterity "of her phyſician. But ſhe ſoon afterwards "conceived another notion which was not "to be removed with ſuch facility. She "thought ſhe had been dead, but that God "had ſent her back to the world with- "out a heart, for he had kept it in heaven. "On this account ſhe was extremely unhap- "py, and more miſerable than any of God's "creatures." *Tulpius.* (Obſ. Med. Lib. 1. cap. 19.)

In other caſes the diſeaſed notions are ſo deeply rooted, that the greateſt addreſs is neceſſary to diſengage them from it; for if it be done in ſuch a manner as brings no conviction to the patient, that he is really cured of his imaginary malady, the effect is generally of the worſt kind. A perſon, "of the name of VICENTINUS, believed he "was of ſuch an enormous ſize that he "could not go through the door of his "apartment. His phyſician gave orders "that

" that he ſhould be forcibly led through it, " which was done accordingly, but not with- " out a fatal effect, for VICENTINUS cried out " as he was forced along, that the fleſh was " torn from his bones, and that his limbs " were broken off, of which terrible impreſ- " ſion he died in a few days, accuſing thoſe " who conducted him of being his murder- " ers." *Marcus Donatus.* (Hiſt. Med. Rar. Lib. ii. cap. 1.)

BOOK

BOOK II.

THE NATURAL HISTORY OF THE MENTAL FACULTIES,

And a Deſcription of the

DISEASES

To which they are ſubject;

OR,

A CONCISE SYSTEM OF THE *PHYSIOLOGY and PATHOLOGY* OF THE HUMAN MIND.

Nos qui ſequimur probabilia, nec ultra quam id quod veroſimile occurrerit progredi poſſumus; et refellere ſine pertinacia et refelli ſine iracundia parati ſumus.

Non enim ſumus ii, quibus nihil verum eſſe videatur: ſed ii qui omnibus veris falſa quædam adjuncta eſſe dicamus, tanta ſimilitudine, ut in iis nulla inſit certa judicandi et aſſentiendi nota, ex quo exiſtit et illud, *multa eſſe probabilia.*

CICERO.

CHAPTER I.

ON THE MIND IN GENERAL.

TANTA EST EJUS TENUITAS, UT FUGIAT ACIEM.
CICERO Tufc. Difp. Lib. i.

The danger of attempting to paſs the limits of human underſtanding; the idea of an univerſally diffuſed ſoul embraced by ſome modern writers; the principle which gives riſe to ſuch a notion explained, and proved to depend on very looſe analogies. General view of the phyſical properties of bodies; proofs that there is not one elementary matter. The principles explained on which the more common phyſical properties of bodies depend. The phenomena of mind inveſtigated; the mind has faculties and principles; diſtinction between theſe. The nature of mind examined; DR. PRIESTLEY'S *hypotheſis invalidated. Facts and arguments which ſhew that the mind*

mind is diſtinct from any part of our frame which is evident to the ſenſes. What conclusions are to be drawn from theſe facts.

THE attempt to define the nature of the mind, or ſoul, is as vain and preſumptuous an undertaking as it is to try to find out, by thought alone, the nature of the Almighty: or whether he exiſted before time, or had himſelf a beginning. We have no means of throwing any light on ſuch ſubjects as theſe, inaſmuch as we have neither any direct facts, which explain them, nor have we even the moſt diſtant analogies to juſtify and direct ſpeculation. Whether we elevate our thoughts to heaven, and conſider the various conſtellations which enlighten the firmament, in the hope of diſcovering its wonderful fabric, or depreſs them to the globe which we inhabit, and analyze the many objects it preſents to our ſenſes; whether we take a grand and comprehenſive view of the whole frame, and ſtructure of the world, or examine with a curious and inquiſitive eye, the minuter parts of which

which it is compoſed, we ſhall find on every hand certain boundaries, beyond which it is impoſſible to penetrate either with ſucceſs or ſafety.

The limits of human reaſon are clearly marked, and may be eaſily diſcerned by every inquirer, with whatever ardor his reſearches be conducted, provided his judgment be not faſcinated by the paſſion of pride, or not incumbered with the ſtrange and irremoveable prejudice, that the powers and perfection of man have no limits.

The concluſions, indeed, which are drawn concerning the more hidden ſecrets of nature, by ſome great luminaries of the preſent age, are done with ſo much apparent eaſe and quickneſs, as to ſhew that they have not run any very great hazard from an over exertion of thought. As ſoon as a few analogies only have been diſcovered between ſome of the more obſcure phenomena of the natural world, a ſuppoſition ſeems inſtantly to have ariſen in their mind, that the cauſe of theſe phenomena muſt be

be ſimilar. The conjecture is not examined with caution, but is immediately erected into a ſplendid hypotheſis.

Many of the Greek and Roman philoſophers, becauſe they could not account for a number of wonderful events, which they obſerved in the natural world, ſuppoſed the whole of them to depend on the agency of one active principle. The motion of the heavenly bodies; the ſhooting meteors of the ſky; the aſcenſion and precipitation of water; the heat of animals, their motions, inſtincts, procreative powers, and intellectual faculties; the growth of plants, their ſtates of watching, and ſleep, their life, and death; and many other objects of philoſophical wonder, gave riſe to the notion, that one divine energy, or common mind, was diffuſed throughout, and animated the whole world.

Principio cœlum ac terras, campoſque liquentes
Lucentemque globum lunæ, titaneaque aſtra,
Spiritus intus alit, totamque infuſa per artus
Mens agitat molem, et magno ſe corpore miſcet.

VIRG. Æn. vi.

Although

Although many of the phenomena which induced the ancients to believe in the influence of one generally diffufed foul have been fully explained by modern fcience, and fhewn to arife from a number of very different caufes, yet the general doctrine has been embraced by many diftinguifhed writers of the prefent age, efpecially by PLATTNER, in his *Anthropology*, p. 46; by HERDER, in his *Philofophy of the Hiftory of Mankind*, B. I. p. 170; and by Dr. DARWIN, in various parts of his beautiful poem, entitled, the *Botanic Garden*, and in his *Zoonomia*. Although the belief of thefe authors has not arifen from the difficulty of explaining the fame facts which influenced the minds of the ancients, yet the notion feems to have fprung up from the fame kind of general principle. Obfcurity, in regard to the caufes of certain phenomena, has been often looked on as the proof of fimilarity; and when any number of appearances, therefore, are difcovered, which cannot be eafily referred to any well known fource, the imagination is apt to afcribe the whole of them

to

to the iufluence of one which is occult, or hidden.

Dr. Darwin has thought he has diſcovered a certain reſemblance between the phenomena of irritability, ſenſibility, and mind. He has increaſed this belief by a fanciful conjecture concerning the motion of nerves; and from theſe circumſtances, it would appear, he has been induced to think that the three principles juſt now mentioned are only modifications of one and the ſame energy, which he calls ſpirit of animation.

In the inveſtigation of ſuch a ſubject as that of mind, we muſt not reſt ſatisfied with the looſer analogies which ſeem to captivate men of lively fancy, and reſtrain them from further inquiry. Let us examine the properties of bodies with as much attention as we can, and ſee how far the analyſis leads us.

However various the appearances may be which are to be obſerved in different bodies, yet there is one quality which is common to all of them, I mean form or ſtructure. We imagine

imagine that the form of bodies arifes from the arrangement of a vaſt number of imperceptible atoms, or particles, which we chooſe to call by the general name of *matter*.

As theſe atoms to which we give the name of matter, are never objects of ſight, or of any of our ſenſes, except when they are in a ſtate of arrangement, and forming bodies, ſo we can have no knowledge of their real nature.

Every individual ſubſtance which conſtitutes a part of the globe which we inhabit, has a form of ſtructure peculiar to itſelf. Thus the arrangement of particles, which compoſe a granite, a piece of baſaltes, a ſerpentine, a piece of quarz, a calcareous ſpar, a piece of gold, lead, or iron, &c. is different in each body. Several bodies are evidently compoſed of mixed materials, and we obſerve that every variety of mixture gives them a variety of form, or appearance, from which we conclude that there are a great variety of elementary matters which compoſe the individual

vidual ſubſtances of which the earth is conſtructed. This concluſion is confirmed by the aid of chemiſtry, for in analyzing bodies we diſcover a number of ſimple elementary principles, each of which has diſtinct properties.

Not only a difference in the number and kind of elementary parts of a ſubſtance produce an alteration of form or ſtructure, but the ſlighteſt variety in the proportion of the ingredients does the ſame thing even where they are ſimilar in kind. Thus the calcareous ſpar (native cryſtallized carbonate of lime) when its ingredients are in a certain proportion conſtantly aſſumes a rhombic form: it is of no conſequence where it comes from, whether from Peru, or the Hartz, from Cumberland, or Chemnitz; but if the ſlighteſt alteration takes place in the number or proportion of the ingredients, there immediately ariſes a deviation in the figure of the ſubſtance: it is then cryſtallized, either in a rhombic form, the acute and obtuſe angles of which are different from thoſe of the primitive rhomb, or elſe the particles which are ſuperpoſed on the rhombic

rhombic nucleus are depoſited in ſuch a manner as to give a new mathematical form to the ſubſtance; thus, of this ſpar we have no leſs than near five hundred different varieties of the rhomb, all of them depending either on a variety in the number of their elementary parts, or on their proportions. The proof of this aſſertion is to be found in the celebrated work of Monſ. ROMÉ DE l'ISLE, intitled *Eſſai ſur la Cryſtalographie;* and in the various Memoirs of that acute and deep inveſtigator of nature, the Abbé HAUY; and in the ſuperb collection of models of cryſtals, made by my friend, the ſcientific and amiable Count de BOURNON, and preſented by him to the Hon. CHARLES GREVILLE, in whoſe poſſeſſion they now are.

Independently of mixture, number, and proportion of the elementary parts of dead bodies, their external appearance and internal ſtructure are greatly owing to the mechanical attraction which the integrant molecules have for each other.

Now on theſe cauſes moſt of the phyſical properties of inanimate bodies depend, ſuch as the form or ſtructure, hardneſs or ſoftneſs, gravity or levity, roughneſs, ſmoothneſs, colour, &c.

It may be laid down as an axiom *that every variety in the natural form of an inanimate or dead body, ariſes from ſome change in the number, kind, or proportion of the elementary parts of which it is compoſed, and on the mechanical attraction which the molecules have for each other at the time of its formation;* or, in fewer words, theſe qualities depend ſolely on the influence of chemical mixture and mechanical attraction.

Inanimate bodies are of two claſſes; they are either dead vegetables, and animals, or the individual ſubſtances which compoſe and ſurround this globe.

The two former differ from the latter in being organized, that is, they have diſtinct parts, or organs, each of which perform different offices, while the bodies are alive. In

regard

regard to the mere ſtructure or form of theſe organs, it is to be remarked, that if they differ much from each other, this ariſes from the influence of ſimilar cauſes to thoſe on which the difference in the phyſical qualities of various minerals depend, namely, on the number, kind, and proportion of their elementary parts.

If the texture, organization, and other phyſical qualities of bone, are different from thoſe of ligament, and thoſe of ligament different from thoſe of membrane, and thoſe of membrane different from thoſe of muſcle, ſkin, or cellular ſubſtance, &c. it is becauſe the elementary parts of each are different, either in kind, or proportion, or both.

There have been philoſophers who imagined there was but one kind of primitive or elementary matter; and there have been others who, adopting this notion, appear to have rejoiced that they did not ſtand higher in the ſcale of nature than a piece of granite. But every fact which experience yields is oppoſed

to ſuch a conjecture. The compoſition of organic bodies is more various than that of inorganic ones; the materials are of a finer kind, and are of a much more difficult analyſis; and although chemiſtry is greatly improved within theſe few years, we are at this moment far from being ſure that we have detected all the groſſer elements of which the dead bodies of animals are compoſed. We can imitate nature to a great extent in forming mineral ſubſtances, but we can by no means imitate, by means of chemical compoſition, the appearance, or ſtructure, of the ſimpleſt vegetable, far leſs thoſe of animals.

Animated organic bodies, ſuch as living animals and vegetables, differ from the dead ones inaſmuch as they exhibit a vaſt variety of phenomena, which cannot be accounted for on the principles by which we have attempted to explain the qualities of inorganic ones. Some of theſe have been fully inveſtigated in the chapters on irritability, and ſenſibility. In the mineral kingdom nothing ſimilar to ſuch principles is to be detected. They mark the

the limits at which all analogy between the dead and the living world ceafe.

The mind of animals remains to be examined. In doing this, let us recollect how much real wifdom there is in confining our refearches within the boundaries by which Nature has furrounded human thought. Let us confine ourfelves as much as poffible to a plain detail of facts and obfervations. I have hitherto endeavoured, in this chapter, to carry the analogy which exifts between the dead and the living world, as far as facts and fair reafoning will permit, left it might be faid that in the difquifition which is to follow, I had thrown them intirely afide.

When the head of an animal is cut off, every phenomenon of the mental faculties ceafes; but this is not the cafe with thofe which depend on the more common principles of animal life (irritability, and the nervous principle) for thefe continue to exert their influence for fome time afterwards. In thofe animals which feem to have the leaft

mind,

mind, ſuch as the cold-blooded ones, theſe common principles continue to excite their energy the longeſt; thus a frog will leap and crawl about for many hours after its head is cut off; and certain butterflies complete the act of generation after having ſuffered the ſame cruel treatment. (See Appendix, No. 3.) Theſe facts, and the conſciouſneſs which attends all mental operations cauſe us to believe that there is a certain point, or place, within the head, where all nervous ſenſations terminate, and where they unite and become objects of perception and thought. That thing which perceives them, as it were, we call *mind*, or *ſoul*, in contradiſtinction to the word brain. That part of the brain which we call the optic nerve, cannot either perceive, or compare the ſenſations which are peculiar to the nerves of the ear; thoſe of the ear cannot perceive, or compare thoſe which are peculiar to the tongue, or noſe; thoſe of the tongue, or noſe, cannot compare thoſe of the nerves of the ſkin; but to this indeſcribable ſomething, called mind, it is quite indifferent whether the ſenſations are received by the optic nerves, or

or the auditory ones, or by thoſe of the noſe, or palate. It can compare them all with each other; thoſe of ſight with thoſe of touch, and thoſe of ſight and touch with thoſe of hearing, &c.

The mind has faculties and principles, but this is a circumſtance which has not hitherto been remarked ſufficiently by any writer on pſychology.

The word *faculty* ought to be accurately diſtinguiſhed from the word *power*, with which it is too often confounded, not only in converſation, but in writing. People ſpeak of the powers of the mind, when they mean its faculties, and *vice verſa*, they ſpeak of faculties when they mean powers. Every man who is not an idiot, and in good health, is poſſeſſed of ſimilar *faculties* of mind with the reſt of mankind who are alſo ſane, and in good health of body; but no one man, perhaps, has ſimilar *powers* of mind with another. Every man is endued with the *faculty* of memory, but ſome men poſſeſs the *power*

of

of memory in a much higher degree than others; every man can judge, but the *power* of judging ſeems to be very unequally diſtributed.

The number of the mental faculties is by no means agreed on by philoſophical writers. Some enumerate five only, viz. the faculty of forming ideas, or perception; the faculty of aſſociating ideas; the faculty of remembering them; the faculty of imagining; and the faculty of judging. But other writers add to theſe the faculty of conceiving, and thoſe of abſtracting ideas, and of combining them. This point cannot be ſettled without entering into a minute inveſtigation of the phenomena of each of theſe faculties; and as this is done in the ſucceeding chapters of this book, there is no neceſſity for repeating what is therein contained.

Independently of the faculties which have been mentioned, the mind is endued with two other properties which, in my opinion, ought to be called *principles*. The difference be-

tween

tween the faculties and the principles of the mind is this; the faculties modify the senso-rial impressions in a great variety of ways, giving them new characters, and qualities, and converting them into objects of thought and reason, just as the functions of the body change the food into a variety of new matters which have many distinct properties from the food as it is received into the body. The principles of the mind, on the other hand, do not modify the sensorial impression, but are excited into action by them; and their action is transferred to the faculties, just as the living principles of the body (irritability and the nervous principle) do not act on the food and blood, and on external bodies, but are excited into action by them. The two principles of the mind are *consciousness* and *volition*.

Consciousness does not modify our thoughts, neither does volition do so; but memory, imagination, and judgment, all operate on our perceptions, giving them different characters.

In

In regard to the eſſence, or nature of that *ſomething*, which is endued with theſe faculties and principles, three different opinions are entertained by ſpeculative philoſophers. The firſt is that the mind, and brain, are one and the ſame ſubſtance. The ſecond is, that the mind, or ſoul, is corporeal, but of a very different kind of matter from that of brain. And the third opinion is, that mind is an immaterial ſomething deſigned by the word *ſpirit*.

Of all ſpecies of materialiſm, that one appears to me to be the moſt completely abſurd which is founded on the ſuppoſition that brain and mind are one and the ſame ſubſtance. Yet this doctrine is embraced by one who has added more uſeful facts to ſcience, and more ornaments to philoſophy than almoſt any other modern writer. (*a*)

It

(*a*) In the preface to Dr. PRIESTLEY's celebrated work on Matter and Spirit, when ſpeaking of the motives which induced him to think deeply on the ſubject, he ſays, "Con-"tinuing to reflect upon the ſubject, I became ſatisfied that, "if we ſuffer ourſelves to be guided in our inquiries by "the

It is not to be expected that I ſhould enter fully into the merits and demerits of all the arguments which Dr. PRIESTLEY has brought forward in ſupport of his favourite opinion. Many of them are of ſuch a nature as to be founded entirely on the notions he himſelf entertains about the primitive qualities of matter. But this is a ſubject which will ever remain a queſtion of controverſy; ſince it cannot be determined by any facts, what theſe are, and conſequently there can be no ground for general conviction. Of two men who embrace different opinions concerning matter, one may indeed refute the other, but this will be no proof that the one who has gained this conqueſt has himſelf diſcovered the real truth, or that his notion is leſs fanciful; it only evinces that he has built a ſyſtem on better grounds than his antagoniſt. Matter and ſpirit are terms almoſt equally unintelligible in themſelves. We have never ſeen that princi-

" the univerſally acknowledged *rules of philoſophizing*, we " ſhall find ourſelves unauthorized to admit any thing in " man beſides that *body* which is the object of our ſenſes."

ple

ple of bodies, which philoſophers underſtand by the word matter, any more than we have ſeen that which they denominate ſpirit. We define it to be that of which all bodies are compoſed; but this definition does not throw any more light on its real nature, than the definition of mind explains what the eſſence of mind is. We have the folly to aſcribe to matter a number of qualities, but which, when properly conſidered, are only the properties of bodies. Two hard bodies cannot occupy the ſame ſpace at the ſame time; and the principle on which this depends we call *ſolidity*. Bodies occupy ſpace, and we ſay they have *extenſion*. All bodies move towards each other when no obſtacle is in the way; and the principle on which we ſay this depends, we call *attraction*. Theſe concluſions in our mind we transfer by analogy, to matter, although we know nothing about it, and we ſay it is ſolid, and poſſeſſed of attraction, and that it has extenſion.

In order to demonſtrate the great danger of ſuch reaſoning, or rather ſuch aſſertions (for

(for it does not deſerve the name of reaſoning), we have only to read Dr. PRIESTLEY'S work already alluded to; and ſee into what a dilemma he brings himſelf by a ſimilar mode of arguing. He, indeed, denies ſolidity and extenſion to be qualities of matter, and defines it to be mere centres of attraction and repulſion. He is evidently well aware that the mind of man cannot have a clear notion of what is meant by a centre of attraction or repulſion, as a property of matter, but by ſuppoſing ſome very minute atom placed there, which is endowed with the qualities of attraction and repulſion; but as this notion would completely refute the concluſion he wiſhes to draw from it, he takes care repeatedly to affirm that the centre which attracts and repels, has not the dimenſions of a phyſical point; and that it has no kind of ſolidity or extenſion! (See his Diſſertations on Matter and Spirit, p. 16.) In the name of common ſenſe, what is this thing? Is there leſs abſurdity in calling that a ſpirit which is thus diveſted of every corporeal quality, than in calling it matter? If ever there

was

was a boundary put to human underſtanding, it is here.

Let us now turn our attention to another ſeries of Dr. PRIESTLEY's arguments, on which the mind can dwell with ſafety, and which are capable of being underſtood. " Had " we formed a judgment concerning the ne- " ceſſary ſeat of thought, by the circum- " ſtances that univerſally accompany it, which " is our rule in all caſes, we could not but " have concluded that in man it is a property " of the *nervous ſyſtem*, or rather of the *brain*; " becauſe, as far as we can judge, the faculty " of thinking, and a certain ſtate of the brain, " always accompany, and correſpond to an- " other; which is the very reaſon why we " believe that any property is inherent in any " ſubſtance whatever. There is no inſtance " of any man retaining the faculty of think- " ing when his brain was deſtroyed; and " whenever that faculty is impeded, or in- " jured, there is ſufficient reaſon to believe " that the brain is diſordered in proportion: " and

" and therefore we are neceſſarily led to con-
" clude the latter as the ſeat of the former.

" Moreover, as the faculty of thinking in
" general ripens and comes to maturity with
" the body, it is alſo obſerved to decay with
" it; and if, in ſome caſes, the mental facul-
" ties continue vigorous when the body in
" general is enfeebled, it is evidently becauſe
" in thoſe particular caſes the brain is not
" much affected by the general cauſe of
" weakneſs. But, on the other hand, if the
" brain alone be affected, as by a blow on the
" head, by actual preſſure within the ſkull, by
" ſleep, or by inflammation, the mental fa-
" culties are univerſally affected in proportion.

" Likewiſe, as the mind is affected in con-
" ſequence of the affections of the body and
" brain, ſo the body is liable to be recipro-
" cally affected by the affections of the mind,
" as is evident in the viſible effects of all
" ſtrong paſſions, hope or fear, love or an-
" ger, joy or ſorrow, exultation or deſpair.
" Theſe are certainly irrefragable arguments
" that

" that it is properly no other than one and " the ſame thing that is ſubject to theſe affec- " tions, and that they are neceſſarily depend- " ent upon one another. In fact, there is " juſt the ſame reaſon to conclude that the " powers of ſenſation and thought are the ne- " ceſſary reſult of a particular organization, " as that ſound is the neceſſary reſult of a par- " ticular concuſſion of the air. For in both " caſes, the one conſtantly accompanies the " other; and there is not in nature a ſtronger " argument for a neceſſary connection, or any " cauſe and any effect. To adopt an opi- " nion different from this, is to form an " hypotheſis without a ſingle fact to ſupport " it." P. 27, et ſeq.

This laſt ſentence contains a falſe charge, ſince it may be ſafely ſaid, that to adopt the oppoſite opinion to Dr. Priestley's, is to form an hypotheſis which is founded on a multiplicity of well eſtabliſhed facts, which he has either been ignorant of, or has not duly conſidered. The hiſtory of diſſections proves that the texture of every part of the brain

brain may be morbidly altered from its natural ſtate, and yet all the faculties of the mind remain entire. The writings of the learned, induſtrious, and modeſt MORGAGNI, and thoſe of BONETUS, and HALLER, contain many caſes of this kind. Portions of the brain have been forcibly detached by cutting inſtruments; great excavations have been formed in it by abſceſſes; ſchirrous, or ſcrophulous tumors, near two inches in length, have been found in it; fungous tumors have ariſen from its ſurface; all its arteries have been found oſſified; its coats have been variouſly diſeaſed; the interior part of the cerebrum, and of the cerebellum, the baſis of the cerebrum, the pituitary gland, the pineal gland, the plexus choroides, have all been found exhibiting morbid changes of ſtructure in people who were in full poſſeſſion of their internal ſenſes. There is a work in the hands of moſt literary men, (or if it is not in their hands, can be eaſily procured,) where a great number of theſe caſes have been induſtriouſly collected with a view of proving the ſame thing which is now advanced; it is there-

fore deemed unneceſſary to fill this chapter with the recital of them. The work alluded to is the *Memoirs of the Literary and Philoſophical Society of Mancheſter*, in the firſt volume of which there is a paper of a very learned phyſician, Dr. FERRIAR, wherein the caſes referred to by HALLER are all collected and tranſlated.

If I were deſired to ſay, in a general way, what thoſe caſes of diſeaſed brain are which moſt commonly produce diſorder in the mind, I ſhould anſwer, they are thoſe in which the arterial action of the brain itſelf is altered from its healthy ſtate; as, for inſtance, in fevers, and general and local inflammations of various kinds. The reaſon of this has been attempted to be explained.

As ſoon as the altered action begins to ſubſide, the healthy operations of the mental faculties return; and, although the diſeaſed ſtate of circulation often produces permanent miſchief in the brain, ſuch as tumors, &c. yet theſe may be formed, and may continue for years, without

without affecting the fenfes. In regard to the point at iffue, therefore, what conclufion can be drawn from fuch facts? In favour of materialifm, the only one is this, viz. that it is not the fubftance of the brain which is mind, but the blood, or the fluids fecreted from it in the brain!

Another argument which Dr. PRIESTLEY adduces in favour of the *corporeality* of mind is this, that our faculties decay in proportion as the body grows old and infirm; but this, like many other general affertions, has full as many facts oppofed to it as thofe which are brought forward in fupport of it.

If it can be proved that moft people who duly exercife the memory, imagination, judgment, and all the other mental faculties, gradually improve in mind, whilft the body is decaying, and finking into the grave, it is furely more than a prefumptive proof that the elements of the foul (if I may be allowed the expreffion) are quite diftinct from the materials of which the body is compofed. In fupport of

this propofition, an authority of high name, and unbiaffed by any of the fhallow fyftems of modern times, may be brought forward. CICERO, in his philofophical and very beautiful Effay on Old Age, mentions many inftances of men poffeffing the full vigour of their intellects after their phyfical force was nearly exhaufted, and accomplifhing works of great fame at a very advanced period of their lives. The firft he takes notice of is QUINTUS FABIUS MAXIMUS, a man of confummate wifdom, and of more erudition than the Romans at that time in general poffeffed. His fon died after he had obtained the confular dignity, on which occafion he compofed a celebrated funeral oration; and CICERO, when he mentions this, takes the opportunity of paffing an eulogy on the mental powers of this diftinguifhed old man. "Multa in eo viro præclara cognovi; "fed nihil eft admirabilius quam quomodo "ille mortem filii tulit, clari viri et confu- "laris: eft in manibus laudatio, quam quum "legimus quem philofophum non contemni- "mus! Nec vero ille in luce modo, atque "in oculis civium magnus; fed intus, domi-

"que

" que præſtantior; qui ſermo! quæ præcepta! " quanta notitia antiquitatis! quæ ſcientia " juris augurii! multæ etiam, ut in homine " Romano, literæ! Omnia memoria tenebat, " non domeſtica ſolum, ſed etiam externa bel- " la; cujus ſermone ita tam cupide fruebar " quaſi jam divinaram id quod evenit, illo ex- " tincto fore unde diſcerem neminem."

CICERO mentions many other facts of great importance in the preſent queſtion. PLATO died while compoſing a work in his eighty-firſt year. ISOCRATES finiſhed his *Panathenaicus* in his ninety-fourth year, and his teacher, LEONTINUS GORGIAS was equal to all the ordinary employments of life at the very advanced age of one hundred and ſeven!

Were not all the ancient governments ſupported and maintained by old men? In order to be a magiſtrate of Lacedæmon it was neceſſary to be far advanced in life. " Old age (ſays CICERO) " does not extinguiſh genius, " provided active ſtudy be not abandoned. " Quid juriſconſulti? quid pontifices? quid " philoſophi

"philoſophi ſenes? quam multa meminerint!
"manent ingenia ſenibus, modo permaneat
"ſtudium, et induſtria; nec ea ſolum in cla-
"ris et honoratis viris, ſed in vita etiam pri-
"vata et quieta. Sophocles ad ſummam ſe-
"nectutem tragœdias fecit; quod propter
"ſtudium, quum rem familiarem negligere
"videretur, a filiis in judicium vocatus eſt,
"ut quemadmodum noſtro more male rem
"gerentibus patribus bonis interdici ſolet;
"ſic illum, quaſi deſipientem a re familiari
"removerent judices. Tum ſenex dicitur
"eam fabulam, quam in manibus habebat, et
"proxime ſcripſerat, Œdipum Coloneum re-
"citaſſe judicibus, quæſiſſeque, num illud
"carmen deſipientis videretur; quo recitato,
"ſententiis judicum eſt liberatus."

But as recent examples are generally more ſtriking than ancient ones, I ſhall borrow a few facts from the unfiniſhed page of biography. And, firſt, let our attention be turned to an author, who, in whatever light his political principles and career may be viewed, doubtleſs claims a firſt place in the pantheon of

of Genius. Although weighed down by miſfortunes of the moſt afflicting nature, and enfeebled by old age, and by bodily diſeaſe, we have ſeen him lately ſhine forth as one of the moſt brilliant meteors which has illuminated the horizon of modern literature. It is ſurely unneceſſary to mention the name of Mr. BURKE. Can any one ſuppoſe for a moment that the mind of that man made a part of his decayed frame? Do not his laſt publications evince a vigour of intellect not only uninjured by time, but even ſuperior for the ſplendor of language, the vividneſs of imagination, and richneſs of thought, to thoſe which were compoſed in the meridian of his life? Are not Lord MANSFIELD, Dr. SAMUEL JOHNSON, VOLTAIRE, and the author of Zoonomia, and the Botanic Garden, direct proofs that the mind continues to improve after the body begins to decay? Biſhop BURNET, for the laſt forty years of his life, was a martyr to the ſtone, and a complication of bodily diſeaſes, yet during that time he compoſed many of his beſt writings. Sir ISAAC NEWTON, when near his eightieth year, reſolved, as an amuſement

amuſement for the evening, the celebrated problem of the trajectories which LEIBNITZ had ſent to this country, in full expectation that it would puzzle the firſt mathematician of the age. It is ſaid that Sir Iſaac undertook it one evening after his return from the Mint, where he had been actively employed the whole day, and that he finiſhed it before the morning.

All theſe facts prove that the phenomena and qualities of mind depend on a ſubſtance of a very different kind from brain, or any other part of our frame, which is evident to the ſenſes. And this fact being proved, we muſt conclude, agreeably to the ſtrict rules of philoſophizing laid down by Sir ISAAC NEWTON, and ſo warmly recommended to the attention of philoſophers by Dr. PRIESTLEY, that the mind muſt be either a matter of a different kind from brain, or elſe a ſomething which it has been attempted to define by the word ſpirit.

It may be further obſerved in regard to this queſtion, that it is impoſſible to conceive, agreeable to the ſtrict rules of philoſophy, that any body ſhould operate on itſelf in ſuch a manner as ſome of our thoughts operate on brain; producing delirium of various kinds.

It is neceſſary to obſerve, for the ſake of juſtice and candor, that, although it can be proved that the phenomena of mind are quite diſtinct from thoſe which ſeem to belong to brain and nerves, yet this by no means ſettles the original queſtion concerning the materiality or immateriality of the ſoul. Although eſſentially different from brain, it may ſtill be matter. Thoſe who think thus, hope to find an apology for their opinion in arguments drawn from analogy. The uniform experience of mankind, they ſay, teaches us that nothing can act on matter but matter.

"Tangere enim et tangi, niſi corpus, nulla poteſt res."

LUCRET.

But

But as human reaſon is inclined by a natural condition of thought to build its opinions upon the facts which experience yields, ſo the notion that the influence which acts on the brain and nerves, and produces the external phenomena of mind, muſt be a phyſical influence, forces itſelf involuntarily upon the conviction of many. Thoſe who think that it is not matter, do not found their opinion on argument, but belief. The evidence of our ſenſes, the principal ſource of our knowledge, does not teach us any fact ſimilar to this. The doctrine of immateriality is therefore a ſubject of faith, not of reaſon.

It may be worth while, before we relinquiſh this ſubject, to take a conciſe view of the various concluſions to be drawn from the facts and arguments which have been adduced in treating it.

After the phyſiologiſt has carried his inquiry as far as poſſible into the nature and effects of irritability, and nervous ſenſibility, as well as into thoſe of the mechanical and chemical

powers

powers which operate on the human body, he ſtill meets with many phenomena which he cannot account for by the known influence of theſe agents. All the impreſſions received on the external extremities of nerves to which we give the name of ſenſations, are conveyed to the head, and ſeem to unite there in one point. Their production in the nerves, and their tranſmiſſion along them, the phyſiologiſt can tolerably well account for; but as ſoon as they arrive at the place alluded to, new phenomena occur, which are totally diſſimilar from any thing depending on the organization of brain, or nerve: a thought ariſes! an idea is preſent to his mind, which makes him conſcious of the exiſtence of the external body which acted on him! He endeavours to collect all the obſervations which theſe new phenomena yield, and after having done this, and having found that he cannot account for them by the knowledge he has obtained of nervous matter, he naturally refers them to an occult cauſe which remains to be examined. He diſcovers, by means of many facts, that this occult cauſe is acted on by external bodies, through

through the medium of our ſenſes; and on the other hand, he obſerves alſo, that it re-acts on the brain, and on the corporeal part of man, inaſmuch as a ſingle thought often alters every healthy action of the body: a power, however, muſt reſide in ſomething; it muſt have a ſubject. It cannot be brain; for in no inſtance whatever does a body act on itſelf ſo as to alter its natural phenomena. But the mind does this in regard to the brain; a thought alters the whole of its action; he is therefore perſuaded that there is ſomething in man diſtinct from brain, to which the phenomena of mind are to be aſcribed. The next ſtep is to find out its nature; but here he ſees himſelf ſurrounded by innumerable difficulties: it may perhaps be diſtinct from brain, and yet corporeal. This ſuppoſition leads him to inveſtigate what that is which is called *matter*, and he ſoon diſcovers, if he is not tainted with any hypotheſis, that he cannot acquire a clear idea of its real nature from experience. It is not an object of ſenſe. He is told that the occult cauſe is a *ſpirit*, or immaterial ſubſtance. Here he is totally at a loſs; but when he reflects on the term, and how the notion of *ſpirit* ſhould have

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arisen in the mind of man, he begins to doubt whether the consciousness which all men have concerning the difference that exists between the external world, and their own mind, may not have first given rise to the expression. If all that is meant by the word spirit be this, that it is a *something* distinct from our body, he accedes to the accuracy of the distinction, for sound reasoning, founded on experience, has led him to the same conclusion. He grants that the mind is not an object of external sense ; he grants that it does not occupy space ; yet the belief of its existence is forced upon him by the consciousness of what passes within himself; he knows not what to decide, but thinks it is loss of time to dispute about words. He is convinced that the true manner of studying the human mind is by beginning with the study of the human body ; and he is persuaded that whoever studies it deeply will be convinced that the mind is totally distinct from that part which is evident to the senses. In other respects it is of very little importance to him whether it be called a matter *sui generis*, or an *immaterial substance*. Neither of these terms explain any thing to him.

CHAP-

CHAPTER II.

ON ATTENTION, AND ITS DISEASES.

Definition of the faculty of attention; difference between it and the power of attention; what ſtimuli excite it. The queſtion whether it is under the influence of volition examined. The great readineſs with which we attend to ſome ſubjects and objects, when compared with others, accounted for; the effects of education on attention. The morbid alteration of this faculty reduced under three claſſes, and each of them deſcribed and enlarged on.

WHEN any object of external ſenſe, or of thought, occupies the mind in ſuch a degree that a perſon does not receive a clear perception from any other one, he is ſaid to attend to it. The principle that is excited in his mind by a perception, or thought, is commonly called the *faculty of attention*; a faculty which

which may be juſtly ſaid to be the parent of all our knowledge.

The experience of every man muſt lead him to acknowledge that the *power* of attention is different, not only in different individuals, but alſo in himſelf at different times. He meets with many who appear to him to exert it in a much ſtronger degree, and for a much longer period of time, than he himſelf can do; and he alſo diſcovers that ſome others are much inferior to himſelf in theſe particulars. He alſo obſerves that he himſelf cannot attend ſo well when wearied with fatigue, or oppreſſed with a full meal, or debilitated by diſeaſe, as when theſe cauſes do not operate: a proper diſtinction, then, ought to be made between the *faculty* and the *power* of attention. The faculty is the ſame, whether in action or not; the power is the degree of excitement produced by the application of mental ſtimuli.

The ſtimuli which ſet it in action, in the firſt place, are either perceptions of external objects,

objects, or those renewed in the different operations of memory, imagination, and judgment, and when it is disengaged from one set of perceptions and thoughts, and passes to another, this happens either by means of the association of ideas, or by our being accidentally affected by some stronger impression than that with which we were previously engaged. The first of these positions is illustrated by finding that our attention passes easily, as it were, from one part of a chain of argument to another, which we have been accustomed to connect together, or from the recollection of any one past event to a multitude of others associated with it; and the second is elucidated by the facts, that a sudden and strong light, such as a flash of lightning, a loud and sudden noise, and bodily pain, all withdraw the attention from the thoughts it was occupied with the moment before these events occurred.

Are there any other powers which act on attention beside the mental stimuli already mentioned? When we refer to what passes within ourselves, we are inclined to think that attention

tion can be increaſed by volition. There is no cauſe to be diſcovered in the nature either of attention, or volition, why this ſhould not be ſo; but the opinion is conſidered as very unphiloſophical by ſome modern writers, eſpecially by thoſe who deny the free agency of man. It is ſaid that no man wills to be attentive, without ſome cauſe excites him to form that reſolution. The cauſe that does ſo is a motive, and all ſtronger motives overcome weaker ones; therefore, when a perſon wills to be attentive, he only yields to a ſtronger impreſſion than that which acted on his mind before this act of volition took place; and therefore we are deceived when we call this a voluntary act.

That the will cannot be excited to act without a cauſe, requires no great depth of philoſophical knowledge to comprehend. The queſtion, however, is not how the will is excited; the anſwer to that is of no conſequence in the preſent caſe: all that we wiſh to know is whether volition has not a powerful influence on the faculty of attention.

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There are, unfortunately, no external phenomena which enable us to judge of what paſſes in the mind of others on ſuch occaſions as are fitted to determine this point; but as conſciouſneſs is a principle which makes us acquainted with the exerciſe of our own faculties, it is reaſonable to depend on it for a proof. The conviction of every man who is not fettered by any philoſophical hypotheſis, is, that he can increaſe attention by an effort of volition; and when he wiſhes to excite the attention of any one elſe, he generally does ſo by exciting the will of that perſon. When we form a reſolution to act in a certain manner, on any particular occaſion, does it not often require the ſtrongeſt effort of volition to attend to the reſolution ſo as to exclude the impreſſion of motives which, phyſically ſpeaking, are of a much more powerful kind? A perſon by previouſly forming a reſolution to ſubmit to certain bodily pain, without uttering a groan, voluntarily directs his attention to ſome imaginary object, and he feels, or in other words, he is conſcious of the voluntary exertion it requires to keep his attention fixed

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on that object under the pains he is suffering. Certain American tribes by fixing their attention on the hatred they owe their enemies, and the injuries which they or their friends have formerly received from them, sustain, without uttering a groan, the most excruciating pains which can be inflicted on the human frame. An Italian criminal, by voluntarily representing to himself the gibbet, and strengthening the representation by frequently calling out *Io ti veddo, Io ti veddo,* sustained all the cruel pains of the torture without confessing his crime.

The principal effect which attention has on the mind, is to render all perceptions and thoughts clearer and more vivid, and consequently to lay the foundation of a sure and faithful recollection, and to render judgment quicker and more correct.

As the mere force or intensity with which we employ attention is, in a great degree, a voluntary act, and as all acts of body and mind are more easily renewed in proportion to the

number of times they are repeated, it is evident how much the attention of parents and inſtructors of children ought to be directed to this circumſtance. It is almoſt impoſſible to begin too ſoon to render children attentive to the objects of their education.

There is a very ſingular fact attending the exercife of this faculty, which muſt have ſtruck many people, but which, as far as my reading extends, has not yet been attempted to be explained. It is the great readineſs with which we attend to certain ſubjects and objects rather than to others. The fact is ſo general that it is deemed unneceſſary to adduce inſtances of it with the ſole view of confirming the aſſertion. Inſtances muſt be adduced at all events, to prove the influence of the cauſes I ſhall aſſign for this curious pſychological phenomenon.

As far as my own obſervation goes, it appears to me to depend, in moſt caſes, on one of the two following circumſtances:

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1ſt. The conſtitutional proneneſs which we have to certain paſſions and emotions, rather than to others.

2dly. The influence of certain deſires, paſſions, and emotions, to which we have not, indeed, any original or conſtitutional proneneſs, but which we have acquired from education, from our ſituation in life, our profeſſions, or cuſtomary avocations, and various circumſtances which regard our relationſhip with the world at large.

The common manner of explaining the nature of this ſecret influence by means of which certain objects ſeem to arreſt our attention more forcibly than others, is by ſaying that theſe objects intereſt us; and in regard to thoſe things to which we cannot direct our attention with ſteadineſs, they are ſaid to have no intereſt for us. But what do theſe expreſſions mean? This intereſt, what is it?

That ſome men from organization, or conſtitution, as it is commonly called, are diſpoſed to certain emotions and paſſions, rather than to others; as, for inſtance, to the violent emotions of anger, and its modifications; the emotions of fear; the deſire of the ſex, and its modifications, &c. is a fact which daily experience is ſufficient to confirm. Such men have their attention moſt readily engaged by every object or thought which excites theſe emotions. A perſon of an irritable diſpoſition ſeems to the generality of mankind, from the mere influence which this law of the œconomy has over him, to take delight in ſeeking for ſources of quarrel, controverſy, and ill humour. A timorous perſon ſeems to create cauſes of alarm and apprehenſion from the ſlighteſt occaſions.

Although the deſires, emotions, and paſſions to which certain individuals are moſt ſubject, from the original conformation of their nerves, neceſſarily give a particular bias to this faculty of attention, eſpecially among uncultivated men, and ſavages, inaſmuch as

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it is moſt readily engaged by the objects which excite theſe affections; yet it cannot be denied, that education may do a great deal to modify it. The tendency to any paſſion may be diminiſhed by many correctives, but theſe muſt be very judiciouſly applied in early infancy, and employed with unremitting care for a great length of time, in order to produce this happy event.

Let us take a curſory view of the influence of the ſecond ſet of cauſes, I mean thoſe deſires and paſſions to which we have not any particular proneneſs from conſtitution, but which become predominant in the courſe of our lives from various habits, from our mode of education, profeſſions, avocations, and other relationſhips which regard our commerce with the world.

This ſubject is of immenſe extent, and is highly intereſting if viewed in a proper light; for it contains a great ſtore of pſychological riches, inaſmuch as it explains the effect which various ſyſtems of education, and

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various purſuits and profeſſions, have on the mental faculties, and moral qualities of man.

The whole ſubject borders ſo much on ethics, and on moral philoſophy, ſtrictly ſo called, that it cannot conſiſtently with the plan of this work be minutely examined; but as much of its outline may be given as will prove ſatisfactory in regard to the aſſertion which has been made.

Education has for its object the improvement either of the body or mind, or both. The actions of the body which are to be improved by education, are chiefly thoſe which conſiſt of certain concatenations, or aſſemblages of voluntary motions, together with the exerciſe of the external ſenſes. The improvement of the mind conſiſts in ſtrengthening and rendering its various faculties more perfect, and in acquiring a management over the paſſions.

Particular inſtances in which natural geſtures and movements of the body have been rendered

rendered quick and vigorous, yet graceful and eafy; in which the organs of external fenfe have been improved to fuch a degree as readily to feize the moft delicate impreffions, and their differences; and which, therefore, enable a perfon to difcern and relifh whatever is beautiful, as well as fublime, in the external world; and in addition to which attention, memory, imagination, and judgment have been ftrengthened by proper objects of ftudy; and where a great degree of felf-command has been acquired in the moft trying fituations; fuch inftances are oftener met with in the fictions of romance than in the hiftory of men. Such prodigies, exhibiting the wonderful effects of a happy organization, and of education, however, have occurred, if we can give credit to the teftimony of authors. Let no fufpicion of vanity arife, if I mention one of my own name as an inftance: the admirable CRICHTON, one whom the Mufes, the Graces, and Minerva equally patronized. Of all that has been faid of him, much, undoubtedly, muft be confidered as the effects of exaggerated praife, and of that fecret fpring in the human breaft which

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difpofes men to find pleafure in exciting wonder and furprize in the mind of others; but making a proper allowance for thefe motives, there is fufficient evidence of his having fo far excelled the generality of mankind in perfonal accomplifhments, as well as in the powers of his mind, and the knowledge he acquired, as to juftify me in felecting him as an example, illuftrative of a moft extraordinary degree of culture. (*a*)

It is feldom, however, that the attention of youth is directed to fuch a number of objects as are neceffary to the formation of men of this defcription. Of thofe who, according to the prevailing notion of this country, receive the beft education, how few are there who

(*a*) Among the numerous teftimonies in favour of the fuperiority of this man there is one which is not commonly known, though eafily afcertained. A Glafgow edition of the Claffics were dedicated to him, many of which are ftill extant; and as he had no title to fuch an uncommon mark of diftinction from birth, or any other cafual honor, it may be reafonably concluded that his wonderful acquifitions were the real caufes to which it is to be attributed.

arrive

arrive at that eminence which exhibits the effects of a regular and well-conducted culture both of body and mind. Among the universities of Great Britain are there not some who, although richly endowed with the means of promoting knowledge, and who on account of their riches claim a superiority over the others, have yet banished science almost entirely from their gates? It is there, however, that the English student is to be taught how to govern his passions, and direct his attention to grand and useful objects, so that he may become equally the ornament of his friends and his country. Is this done? Does not the youth more frequently imbibe the seeds of many passions and habits which have the worst effect, not only on his own happiness, but on the tranquillity and happiness of society? Instead of the mind being expanded, and strengthened by such branches of study as can alone give a beneficial degree of exercise to judgment, and the powers of reason, is not the education almost entirely passive; and do we not consequently find the greater number of those who have spent the most valuable part of

their life in ſuch ſchools, iſſuing from them with dwarfiſh intellects, and cramped by the moſt narrow and illiberal prejudices; ignorant of true knowledge, and yet believing that it is no where to be gained but where they have been ſo unhappily inſtructed?

It is to be obſerved, that every profeſſion and purſuit of life may be conſidered as a ſpecies of education, which, by creating artificial wants and deſires, cauſes a vaſt diverſity in the proneneſs which men have for attending to certain objects and ſubjects of ſtudy rather than to others. It would be a curious ſpectacle to ſee a repreſentative aſſembly of men actuated by the various artificial wants which they create to themſelves by particular purſuits and branches of ſtudy, and that the means of gratifying their deſires were to be ſuddenly granted them, and diſplayed before them. One would ſeize a Greek or Latin manuſcript as a moſt ineſtimable treaſure; another a butterfly, or moth; one would run to an antique ſtatue; another to a piece of painted glaſs; another to a piece of mechaniſm; a piece

piece of ſculpture, a holy relic, a beautiful ſhell, a diſeaſed bone, a new drug, a fine dog, or horſe, would all have their admirers. One man would deſire to mount up on the wings of æther to the milky way; while another would ſeek to penetrate the granitic cruſt of the globe, in order to examine its inmoſt caverns and receſſes.

If all that has been ſaid in this chapter be duly conſidered, it muſt be granted that the readineſs with which we attend to certain ſubjects, and objects, rather than to others, depends on the two principles already ſtated. See p. 261.

As a healthy ſtate of the brain and nerves is eſſentially neceſſary to the due and regular operations of this faculty, inaſmuch as it modifies all impreſſions received on theſe organs, it muſt be evident that it may be greatly altered, or even totally ſuſpended by various diſeaſes of theſe parts.

Attention can hardly be ſaid to be ever morbidly increaſed; for although in many in-

ſtances this faculty is involuntarily engaged for a much longer period of time than is uſual, and in a degree which often proves hurtful, yet it cannot be called a diſeaſe of that faculty. The attention may be preternaturally arreſted, for inſtance, by a diſeaſed perception, ſo that the perſon cannot attend to any thing elſe; as is the caſe in various kinds of hypochondriaſis, and melancholy; but the reaſon why external impreſſions do not, in ſuch caſes, produce their full mental effect, is not becauſe attention is morbidly increaſed, but becauſe it is arreſted by the preternatural vividneſs of the diſeaſed perception. Were it a fault of the faculty itſelf, the energy with which it acted would be equally great to whatever object it was directed, but this is not the caſe; which proves that it is a perception only which is diſeaſed.

The morbid alterations to which attention is ſubject, may all be reduced under the three following heads:

1ſt. The incapacity of attending with a neceſſary degree of conſtancy to any one object.

2dly.

2dly. A total ſuſpenſion of its effects on the brain.

The incapacity of attending with a neceſſary degree of conſtancy to any one object, almoſt always ariſes from an unnatural or morbid ſenſibility of the nerves, by which means this faculty is inceſſantly withdrawn from one impreſſion to another. It may be either born with a perſon, or it may be the effect of accidental diſeaſes.

When born with a perſon it becomes evident at a very early period of life, and has a very bad effect, inaſmuch as it renders him incapable of attending with conſtancy to any one object of education. But it ſeldom is in ſo great a degree as totally to impede all inſtruction; and what is very fortunate, it is generally diminiſhed with age. How it is to be corrected, will be ſpoken of hereafter in the curative part of the work.

The incapacity of attending with a neceſſary degree of conſtancy to any one object, which ariſes caſually, like other diſeaſes, accompanies

panies every nervous disorder, in which the sensibility of the nerves is greatly increased, especially in hysteria. Stomachic complaints, chlorosis and hydrophobia also, induce it. In this disease of attention, if it can with propriety be called so, every impression seems to agitate the person, and gives him or her an unnatural degree of mental restlessness. People walking up and down the room, a slight noise in the same, the moving a table, the shutting a door suddenly, a slight excess of heat or of cold, too much light, or too little light, all destroy constant attention in such patients, inasmuch as it is easily excited by every impression. The barking of dogs, an ill-tumed organ, or the scolding of women, are sufficient to distract patients of this description to such a degree, as almost approaches to the nature of delirium. It gives them vertigo, and headach, and often excites such a degree of anger as borders on insanity. When people are affected in this manner, which they very frequently are, they have a particular name for the state of their nerves, which is expressive enough of their feelings. They say they have the *fidgets*.

Should

Should this ſtate of the nerves continue for a great length of time, or often recur, a habit of inattention is the conſequence, which is afterwards with difficulty removed. In ſome caſes it increaſes to ſuch a degree, owing to the violence and obſtinacy of the bodily cauſes, thoſe for inſtance which ſpring from the worſt kinds of hyſteria, and epilepſy, as often lays the foundation for permanent delirium.

The ſecond diſeaſed ſtate of attention was ſaid to be a morbid diminution of its power or energy. This may ariſe from a great multiplicity of cauſes, ſome of which are *corporeal*, and others *mental.*

The *corporeal* cauſes appear to be capable of being reduced under two heads, or claſſes.

1ſt. Cauſes of debility that operate by exhauſting the principle of irritability, and conſequently diminiſh the ſecretion of the ſentient principle, and which of courſe weaken both external, and ſenſorial impreſſions in

force and clearneſs, and which therefore naturally ſhorten their duration in the brain.

2dly. Organic diſeaſes of the brain, impeding, to a certain extent, the tranſmiſſion of impreſſions.

In both of theſe caſes attention is not ſufficiently excited.

The firſt claſs of cauſes is very numerous fevers of all kinds, eſpecially the varieties of typhus; chronic weakneſs, ariſing from ſtomachic complaints, and other diſeaſes of the abdominal viſcera. It is a curious circumſtance, that the chronic weakneſs which accompanies ſcrophula, and rickets, have no influence in diminiſhing the energy of any of the mental faculties; but chronic weakneſs, ariſing from poor diet, bad air, and confinement in warm apartments, circumſtances to which the inhabitants of large cities, eſpecially the female ones, are peculiarly expoſed; irregularities in diet, exceſſive evacuations, and the abuſe of corporeal deſires, are all cauſes which weaken attention, and conſequently debilitate the whole faculties of the mind.

The

The ſecond claſs of corporeal cauſes are either tumors, which are either gradually formed within, or on the brain, or elſe they are organic derangements of a more ſecret and hidden nature, ſuch as ariſe in conſequence of repeated attacks of epilepſy, apoplexy, convulſions, and blows on the head, &c.

The *mental* cauſes which weaken this faculty are alſo of two kinds,

1ſt. Debility, ariſing from neglecting to exerciſe the faculty ſufficiently, and

2dly. The over-exerciſe, or abuſe of its powers.

The firſt of theſe is a direct cauſe of habitual inattention; the ſecond is an indirect cauſe of a ſpecies of diminiſhed attention, which is for the moſt part of a tranſitory nature.

That neglecting to exerciſe attention is the certain means of inducing a diminiſhed energy

 of

of that faculty, hardly requires any illuſtration, ſince innumerable inſtances are conſtantly occurring which cannot altogether eſcape the notice of the moſt ſuperficial obſerver.

Among the lower claſs of people, attention is, generally, ſufficiently excited by their numerous wants, the preſſure of which, by exciting acute deſires, keeps the faculty alive; and hence the natural ſhrewdneſs and cunning which many of them exhibit in matters which regard their own intereſt. But among the more affluent and independent part of mankind, the exerciſe of attention is commonly dependant on artificial wants, and on thoſe who are entruſted with their education. The influence which the firſt of theſe has on the mind ſhall be inveſtigated in the inquiry into the origin of the paſſions; with regard to the ſecond, a great number of obſervations naturally preſent themſelves to every perſon of reflection who is accuſtomed to think for himſelf.

It

It unfortunately happens that the mental treatment of youth, not only at ſchools and academies, but alſo at home, is generally the ſame for all boys. That of girls is ſubject to a ſimilar fault. The peculiar *ideoſyncraſies*, or diſpoſitions of each individual, are ſeldom ſufficiently attended to; and hence it frequently happens that many of our youth, although endowed with excellent natural talents, remain dunces during the early part of their lives. If they improve afterwards, it is owing to ſelf-tuition, or accidental circumſtances having fortunately thrown ſuch objects of ſcience in their way as are fitted to awaken new deſires, and kindle the flame of curioſity in their mind. That ſome boys muſt be forced to learn by menaces, and fear, and others by intreaty, and kindneſs, is ſo common an obſervation, as to be known by every pedagogue. But although this be the caſe, the practical rule, it is not always judiciouſly applied. There is another obſervation, however, more important than this, that is not generally known, or at leaſt, its force is not acknowledged; it is this: that many boys require very

different

different objects of ſtudy than what others do, in order to have their attention ſufficiently rouſed, and their minds put into due exerciſe. Every public teacher muſt have obſerved that there are many to whom the dryneſs and difficulties of the Latin and Greek grammars are ſo diſguſting that neither the terrors of the rod, nor the indulgence of kind intreaty can cauſe them to give their attention to them. If a boy of this diſpoſition be found to be by no means deficient in natural underſtanding, why ſhould many good years be loſt in a fruitleſs attempt, which muſt evidently become irkſome to the preceptor, and prejudicial to the young perſon? Would a wiſe phyſician inſiſt on it that one kind of diet was that which was moſt ſuitable to every conſtitution? If he found a few individuals who evidently could not digeſt it, would he not endeavour to find out what things were beſt adapted to their peculiar ideoſyncraſies? It will be found, in general, that the boys ſpoken of will eaſily apply to ſome other branches of ſtudy; and if that is the caſe, the natural bent of mind ought not to be forcibly thwarted, or left neglected.

It ought to be recollected that it is a matter of great indifference what it is which a boy firſt learns, provided it is ſome uſeful object, and is of ſuch a kind as to give due exerciſe to his intellectual faculties. If he once gains a habit of attention, it will afterwards be eaſily directed to other things of more conſequence.

Another circumſtance of great importance is this, that as the power of attention is as different in different boys, as their bodily force, ſo their mental diet, if the expreſſion be permitted, muſt alſo be varied accordingly. To ſome, all kinds of ſtudy ought to be rendered eaſy for the firſt years of their lives, while to others a certain number of difficulties are abſolutely neceſſary in order to excite a proper degree of attention. Boys endowed with what is commonly called ſtrong minds, require hard and laborious ſtudy in compariſon with others, if it is meant that they ſhould maintain the ſuperiority for which nature ſeems to have intended them.—Let not this digreſſion, which certainly belongs to the art of preventing mental weakneſs and diſeaſe, be

conſidered

confidered as totally foreign to the phyfiology. It accounts for the ignorance and inattention of a number of men, who, if they had been judicioufly treated in their youth, might have become ornaments to their family, and ufeful members of fociety, but who having acquired an early difguft for ftudy, have fallen a prey to falfe defires and wants, to the great prejudice of their health and fortune.

It has been remarked that debility and torpor of body are caufes which weaken attention, inafmuch as the nerves of fuch people do not convey the impreffions they receive with a due degree of force and clearnefs. The paffions and affections of people of this defcription are naturally weak, and hence they are often of a retired and unfocial difpofition, having few friendfhips, or attachments of any kind, and thefe feldom of a lafting, or durable nature. But when once the habit of commanding attention is fo far weakened as to render a perfon almoft infenfible to external objects, or to the impreffions which awaken the focial feelings, he may then be faid to be

predifpofed

predifpofed to a very bad kind of mental derangement; for if any ftrong paffion be accidentally excited in fuch a cafe, how is the attention to be directed to ordinary matters?

I lately attended a very remarkable variety of infanity of this kind, along with my friend Dr. PITCAIRN, to whom it appeared equally uncommon as to myfelf, although his extenfive practice yields him frequent opportunities of feeing the infane.

The patient was a young gentleman, of large fortune, and who until the age of twenty-one had enjoyed a tolerably uniform ftate of good health. He was of a very delicate and flender frame of body, and of a gentle and calm, but rather unfocial difpofition. He bore evident marks of great debility; his hands and feet were generally cold, his veins were fmall, and although feldom diftended with blood, yet they fhone through the fkin. His countenance was pale, and expreffive of great languor, his hair dark brown, and his eyes blue.

When

When I firſt ſaw him, the mental derangement under which he laboured, appeared chiefly to conſiſt in a moſt uncommon degree of abſence of mind. He ſeemed loſt to every thing around him, and would willingly ſit for near a whole day without moving; yet, with all this, he was not like a melancholy patient; for if his countenance was attentively obſerved, it was eaſy to diſcover that a multiplicity of thoughts were conſtantly ſucceeding each other in his mind, many of which were gay and cheerful. He would laugh heartily, at times, and it was evident from the character of his laughter, that it was not of that unmeaning nature which we often ſee in ideotiſm, but ſuch as any one might happen to fall into who had ludicrous thoughts, and was not under the reſtraint of ſociety. In a moment afterwards the whole expreſſion of his countenance changed, and he would ſink into a deep reverie. In the courſe of his diſorder he became ſo remarkably inattentive, that even when preſſed by ſome want which he wiſhed to expreſs, he would, after he had got

got half way through the ſentence, ſuddenly ſtop, as if he had forgotten what he had to ſay.

When his attention was rouſed, and he was engaged to ſpeak, he always expreſſed himſelf in good language, and with much propriety; if a queſtion was propoſed to him which required the exerciſe of judgment, and he could be made to attend to it, he judged correctly. A total diſregard for thoſe whom he had formerly moſt loved, became daily ſtronger, and at laſt he ſhewed evident marks of diſſatisfaction when viſited by his near relations; yet, unlike melancholy patients, who generally exhibit a ſimilar antipathy, this conduct did not ſeem in him to ariſe from an opinion, either that they had done him an injury, or intended one to him. He would, at times, mutter to himſelf expreſſions of anger at their being preſent; but ſuddenly, as if aware of the impropriety of his behaviour, he would as quickly change the expreſſion of his countenance, and ſeem anxious that they ſhould not hear what he ſaid. In the later periods of his illneſs, however, he was not quite ſo guarded,

guarded, and would, at times, behave rudely, and then he could not be conciliated by kindneſs.

When he was placed in ſuch ſituations as required the exerciſe of attention, in order to preſerve himſelf from danger he commonly exerted himſelf until he became familiarized with it, and then he gradually grew leſs attentive. It was with difficulty he could be made to take any exerciſe. I prevailed on him, however, for a conſiderable time to drive his curricle, and accompanied him in it to watch his mind. For a few of the firſt days he was all attention, but the irkſomeneſs of the exertion made him ſoon tire, and before he had driven half a mile from home, he returned, although no arguments were ſpared to induce him to go on. He drove ſteadily, and when he was about to paſs a carriage, took pains to avoid it; but when at laſt he became familiarized with this exerciſe, he would often relapſe into thought, and allow the reins to hang looſe in his hands. He then began to drive unſteadily, ſometimes laſhing the horſes with

all

all his force, and then ſuddenly checking them until they ſtood ſtill; ſometimes driving very quick, and ſometimes juſt as ſlow. His conduct, in this reſpect, never appeared to be regulated by any wiſh relative to the nature of the exerciſe he was taking, but appeared to me to proceed ſolely from the natural concatenation which habit inſtitutes between the quickneſs of bodily action, and the quickneſs of thought. His ideas, I have already ſaid, were for ever varying. When any one croſſed his mind, which excited anger, the horſes ſuffered for it; but the ſpirit they exhibited at ſuch an unuſual and unkind treatment, made him ſoon deſiſt, and re-excited his attention to his own perſonal ſafety; as ſoon as they were quieted, he would relapſe into thought; if they were melancholy ones, the horſes were allowed to walk ſlow, if they were gay and cheerful, they were gently encouraged to go faſt.

This gentleman generally paſſed a good night, and he was fond of indulging himſelf by laying long in bed. His diſeaſe began with a ſlight ſtate of phrenzy, when abroad on

on his travels, and was excited, according to the opinion of his relations, and the ſervants who accompanied him, by the injudicious conduct of a travelling tutor, whoſe character, according to the reports ſpread of him, was more ſuited for the ſeverities of a monkiſh life, than the companion of a man of faſhion. They had various quarrels; and after the laſt one, which occaſioned their ſeparation, the unfortunate gentleman, whoſe caſe I have given, was obſerved to be very ſtrange in his conduct. Other cauſes of mental diſquietude were repreſented as having joined themſelves to thoſe mentioned; and to the combined influence of the whole the firſt attack of delirium was aſcribed.

It was obſerved, that attention might ſuffer a temporary alteration from its healthy ſtate by being too long exerciſed. This generally conſiſts in a great diminution of its powers, which remains longer, or ſhorter, according to circumſtances. The following caſe, with which this chapter ſhall be concluded, is a very remarkable inſtance of the kind. It is that

that of a Mr. SPALDING, a gentleman well known as an eminent literary character in Germany, and a man much refpected by thofe who know him. The cafe is drawn up by himfelf, and was fent to the celebrated Mr. SULZER, and by him prefented to the editors of the Pfychological Magazine.

" I was this morning engaged with a great
" number of people, who followed each other
" quickly, and to each of whom I was obliged
" to give my attention. I was alfo under the
" neceffity of writing much, but the fubjects
" which were various, and of a trivial and
" uninterefting nature, had no connection the
" one with the other; my attention, there-
" fore, was conftantly kept on the ftretch, and
" was continually fhifting from one fubject
" to another. At laft it became neceffary that I
" fhould write a receipt for fome money I had
" received on account of the poor. I feated
" myfelf, and wrote the two firft words, but
" in a moment found that I was incapable of
" proceeding, for I could not recollect the
" words which belonged to the ideas that were
" prefent

" prefent in my mind. I ftrained my atten-
" tion as much as poffible, and tried to write
" one letter flowly after the other, always hav-
" ing an eye to the preceding one, in order to
" obferve whether they had the ufual relation-
" fhip to each other; but I remarked, and
" faid to myfelf at the time that the characters
" I was writing were not thofe which I wifh-
" ed to write, and yet I could not difcover
" where the fault lay. I therefore defifted,
" and partly by broken words, and fyllables,
" and partly by gefture, I made the perfon
" who waited for the receipt underftand he
" fhould leave me. For about half an hour
" there reigned a kind of tumultuary diforder
" in my fenfes, in which I was incapable of
" remarking any thing very particular, except
" that one feries of ideas forced themfelves
" involuntarily on my mind. The trifling
" nature of thefe thoughts I was perfectly
" aware of, and was alfo confcious that I made
" feveral efforts to get rid of them, and fup-
" ply their place by better ones, which lay
" at the bottom of my foul. I endeavoured,
" as much as lay in my power, confidering
" the

" the great crowd of confufed images which " prefented themfelves to my mind, to recall " my principles of religion, of confcience, " and of future expectation; thefe I found " equally correct, and fixed as before. There " was no deception in my external fenfes, for I " faw, and knew every thing around me; but I " could not free myfelf from the ftrange ideas " which exifted in my head. I endeavoured " to fpeak, in order to difcover whether I was " capable of faying any thing that was con- " nected, but although I made the greateft " efforts of attention, and proceeded with the " utmoft caution, I perceived that I uni- " formly fpoke other words than thofe I in- " tended. My foul was at prefent as little " mafter of the organs of fpeech, as it had " been before of my hand in writing. Thank " God, this ftate did not continue very long, " for, in about half an hour, my head began " to grow clearer, the ftrange and tirefome " ideas became lefs vivid and turbulent, and " I could command my own thoughts with " lefs interruption.

" I now wiſhed to ring for my ſervant, and " deſire him to inform my wife to come to " me; but I found it ſtill neceſſary to wait a " little longer, to exerciſe myſelf in the right " pronunciation of the few words I had to ſay; " and the firſt half hour's converſation I had " with her was, on my part, preſerved with a " ſlow and anxious circumſpection, until at " laſt I gradually found myſelf as clear and " ſerene as in the beginning of the day. All " that now remained was a ſlight headach. I " recollected the receipt I had begun to write, " and in which I knew I had blundered; and " upon examining it I obſerved, to my great " aſtoniſhment, that inſtead of the words *fifty* " *dollars, being one half year's rate,* which I " ought to have written, the words were *fifty* " *dollars, through the ſalvation of Bra—* with " a break after it; for the word *Bra* was at " the end of a line. I cannot recollect any " perception, or buſineſs, which I had to " tranſact, that could by means of an obſcure " influence have produced this phenomenon."

CHAPTER III.

ON MENTAL PERCEPTION, AND ITS DISEASES.

Definition of the faculty; equivalent terms. Dr. REID'S *ſpeculations examined and criticiſed.* ARISTOTLE'S *opinion the baſis of all ſucceeding ones which are foundedon obſervation. The reaſon why two people have not always the ſame perception from the ſame object. How this faculty modifies impreſſions by its active power, ſo as to convert them into objects of thought. Various circumſtances neceſſary for the full production of this effect. What cauſes weaken impreſſions. The meaning of the word* idea *explained. Difference between obſervation and reflection; ſome people diſpoſed to the one more than to the other; the effects which this produces on their mental character. The faculty is ſubject to two idiopathic diſeaſes, and various ſymptomatic ones. The diſeaſes deſcribed and examined.*

WHEN an object acts on any of the nerves which ſupply the organs of external ſenſe, and our attention is not ſtrongly engaged at the

time by any other object, we immediately become conſcious of the preſence of the external body, and we obtain a mental perception, or repreſentation of it.

We become conſcious that ſomething which was not preſent to the mind the moment before, is now preſent to it, and we have an immediate and firm conviction that the body of which we have this intuition is without us.

The faculty which the mind is endowed with, of thus receiving the repreſentation of an external object, is commonly called the faculty of mental perception, which, although a bad term, inaſmuch as it is borrowed from one of the external ſenſes, I ſhall not change. Other terms have been preferred to it by different writers, ſuch as apprehenſion, and conception; the Germans call it *vorſtellungſkraft*, which, literally tranſlated, ſignifies the repreſentative faculty, and is, doubtleſs, far from being a bad expreſſion; but it is ſubject to the ſame objection as perception, inaſmuch as it is a term of viſion. As all words, however, that

that are intended to denote changes which take place in the mind, muſt be borrowed from the language of phyſics, it is of very little conſequence which of them is adopted, provided an author explains what he underſtands by them. In this chapter, the expreſſions mental perception, mental repreſentation, intuition of an external object, and apprehenſion of one, are all employed in a *ſynonimous* ſenſe, and mean the effect which an external object produces on our mind, ſo that we become conſcious of its exiſtence. If one of them ſeems to be preferred at one time to the reſt, it is not becauſe a different idea is intended to be conveyed, but ſolely for the purpoſe of avoiding the repetition of the ſame word.

It muſt be ſufficiently obvious from what has been already ſaid, that the mind does not perceive external bodies immediately, but mediately, through the medium of the nerves and brain. This reflection naturally demands that ſome notice ſhould be taken of the ſpeculations of Dr. Reid, on this ſubject, eſpecially as his diſcoveries, as they are called, militate againſt this

this idea, and have of late been praiſed and adopted by my very learned preceptor, profeſſor STEWART, in his *Elements of the Philoſophy of the Human Mind.*

Dr. REID does not offer any hypotheſis of his own concerning the nature of mental perception, but he attempts to pull down all the opinions of others on that ſubject, eſpecially thoſe of the peripatetics, and of LOCKE and HUME.

It appears to me that the opinions of ARISTOTLE are to be conſidered as the baſis of all the theories of thoſe pſychologiſts, who, like LOCKE and HUME, have taken facts and obſervations for their guide. But the miſapplication which was afterwards made of the terms he employed, and the fanciful notions entertained concerning them by ſchoolmen, have given occaſion to much miſrepreſentation of his doctrine. The doctrine of that great and wonderful genius is a fair logical deduction, drawn from a due conſideration of the qualities of external bodies, and the nature of the external ſenſes, and of mind. He aſſerts that

that " as our ſenſes cannot receive external " material objects themſelves, they receive " their ſpecies;" that is, as he himſelf explains, they receive their images, or forms, without the matter, as wax receives the ſeal without any of the gold of which it is made. To theſe he afterwards gives various denominations, according as they are objects of ſenſation, or refined into objects of memory, imagination, and pure intellection; or, as agreeable to his notion, they become objects of pure ſcience. To diſtinguiſh all which modifications of the forms of external bodies he employed the names *ſenſible ſpecies*, *phantaſms*, and *intelligible ſpecies*.

This doctrine has two parts, the firſt of which relates to the manner in which external objects act on the mind; the other to certain changes which that primary affection of the mind was ſuppoſed to undergo, in conſequence of the operation of ſome of the mental faculties. It is the firſt part of the doctrine only which concerns us; the ſecond is a fanciful conjecture, unſupported by any facts, and hence

hence the terms, *phantaſms*, and *intelligible ſpecies*, ought not to be employed. Dr. REID, however, argues againſt the whole doctrine. He ſuppoſes that external objects affect the mind not through any medium ſuch as the nerves and brain, but that they act immediately on it. He is too cautious to explain how they do this. It is a kind of concluſion that ariſes in his mind, more from having detected the fallacies of the ſchoolmen, than from any obſervations he ſeems to have made on himſelf, or any reaſoning founded on the phenomena, and well known qualities of the external ſenſes. The followers of ARISTOTLE ſuppoſed that the ſpecies, images, or forms, were things which iſſued from the external objects, and entered the mind through the ſenſes; but in doing this they add an hypotheſis of their own invention to the plain facts which ARISTOTLE told. Dr. REID treats this fanciful conjecture with the ridicule it deſerves, but the arguments he employs againſt it do not militate againſt the opinion of ARISTOTLE, that external bodies muſt firſt act in a phyſical manner, on the external ſenſes, before they affect the mind, and that the common ſenſe, or intellect,

tellect, receives these impressions. Dr. Reid, although he affects to have divested the subject of mental perception of all theoretical expressions, has in fact indulged himself in an hypothesis, which I will venture to assert is more fanciful than that of Aristotle's. He supposes that the impressions, which according to his opinion, do not bear any resemblance to the bodies themselves, are only exciting causes of perception; the mind perceives the bodies themselves. Lest it be imagined that I misrepresent Dr. Reid's hypothesis, I shall give it in the words of his friend and admirer, professor Stewart. In page 92 of his *Philosophy of the Human Mind*, after having given a full account of the Doctor's speculations, he says, "To what then, it may be "asked, does this statement amount? merely "to this: that the mind is so formed, that "certain impressions, produced on our organs "of sense by external objects, are followed "by correspondent sensations, (which have no "more resemblance to the qualities of matter, "than the words of a language have to the "things they denote,) are followed by a per-

"ception

" ception of the exiſtence and qualities of the
" bodies by which the impreſſions are made;
" that all the ſteps of this proceſs are equally
" incomprehenſible; and that, for any thing
" that we can prove to the contrary, the con-
" nection between the ſenſation, and the per-
" ception, as well as that between the impreſ-
" ſion, and the ſenſation, may be both arbi-
" trary; that it is, therefore, by no means
" impoſſible, *that our ſenſations may be merely*
" *the occaſions on which the correſpondent per-*
" *ceptions are excited*, and that, at any rate, the
" conſideration of theſe ſenſations, which are
" attributes of mind, can throw no light on
" the manner in which we acquire our know-
" ledge of the exiſtence and qualities of body.
" From this view of the ſubject, it follows,
" *that it is external objects themſelves*, and not
" any ſpecies, or images of theſe objects, that
" the mind perceives; and that, although by
" the conſtitution of our nature, certain ſen-
" ſations are rendered the conſtant antece-
" dents of our perceptions, yet it is juſt as
" difficult to explain how our perceptions are
" obtained by their means, as it would be,

" upon

"upon the ſuppoſition, that the mind were "all at once inſpired with them, without any "concomitant ſenſations whatever."

Independently of the hypotheſes already alluded to and contained in the citation above, it is further to be remarked, that Dr. REID embraces the commonly received notion, that there is a certain act of the mind which intervenes between the impreſſion on the nerves, and the perception, which act, like many other writers on metaphyſics, he chooſes to call ſenſation. In this work it has been attempted to be proved that there is no act of the mind between the impreſſion which external bodies make on the nerves, and mental perception, except the ſenſorial impreſſion be conſidered as ſuch; which however, is nothing elſe than a mere continuation of the phyſical impreſſion, made by the external body on the nerves.

The word ſenſation ought either to be made equivalent with nervous impreſſion, or conſciouſneſs; and whenever it is employed by any author, it ought to be accurately ſtated which of the two it is intended to expreſs.

In

In addition to what has been ſaid in the chapter on ſenſation, it may be obſerved, that no two perſons, perhaps, have exactly ſimilar and correſponding perceptions of any external object whatever. Some cannot diſtinguiſh green from blue, others cannot diſtinguiſh a ſub-acid taſte from a ſaltiſh one; ſome people have no perception of certain colours; hardly three people out of ten will agree perfectly about the exact relation which any one ſhade of colour has to others of the ſame kind; circumſtances which cannot be well explained in any other way than by ſuppoſing that the nerves of different men are differently modified, and that owing to this difference in ſtructure, all external impreſſions muſt alſo be different in ſuch men. If this concluſion be not admitted, the fact muſt be explained by ſuppoſing the mind to be differently *organized* in different men.

A mental repreſentation is that effect which the figure of impreſſion makes on the mind.

As conſciouſneſs is to the mind what ſenſibility is to the body; no repreſentation can take

place

place of which we are not confcious, provided our attention be not ftrongly engaged at the time.

This faculty by which we receive reprefentations, may be faid to be the bafis of all the other mental faculties, for it will be found afterwards that memory, imagination, and judgment, are only the renewal, the combination, and comparing of reprefentations, or intuitions, which have been already received.

As the knowledge we have of any external object is generally acquired through the medium of more than one of the organs of external fenfe, and as our knowledge of the body is a reprefentation of all the individual impreffions it has made on thefe organs, united as it were, into one individual thought, or idea, it is evident that this faculty of the mind is conftituted of an active power which changes the nervous impreffions, and affimilates them to the nature of mind.

In order that this faculty fhall receive clear impreffions *ab externo*, and produce its full mental effects on thefe, fo as to give them the nature

nature and characters of thought, many circumſtances are neceſſary.

It has been proved that the nerves of the external ſenſes alone convey diſtinct impreſſions to the brain, and the phyſical and efficient cauſe of this have alſo been attempted to be demonſtrated. Admitting the mere fact, it is to be obſerved, that all impreſſions calculated to produce a repreſentation in the mind, muſt not only be made with a certain degree of mechanical ſtrength, in order to reach the ſenſorium; but the ſenſorial impreſſion muſt alſo be of a certain degree of force, in order to affect the mind.

There are two claſſes of cauſes which weaken impreſſions ſo much as to render them unfit for affecting the mind. The firſt one is intirely mechanical, the ſecond pſychological. The mechanical cauſes occur when the arrangement at the extremity of a nerve has not been ſufficiently altered by the body applied; the figure of impreſſion, in this caſe, either does not reach the brain, or if it does ſo, the ſenſorial impreſſion that is produced by it is ſo weak as not to be ſufficient for the purpoſe

of

of exciting a reprefentation in the mind. It becomes fo much the more neceffary that impreffions on the extremity of the nerves fhould be made with a certain degree of force, in order to excite a reprefentation, becaufe nature herfelf feems to have been under the neceffity of placing a number of obftacles in the way. The extremities of the nerves of the organs of touch are all covered by the cuticle, and a very fine membrane, the *rete mucofum*. The extremities of the nerves of the nofe are covered by a delicate membrane, and a coat of mucus; thofe of the ear are defended by a membrane, a fluid, and a coat of a thick, fecreted matter; the retina of the eye has many membranes and humours interpofed between it and the rays of light. In fhort, the extremities of the nerves are no where expofed to the immediate impreffion of external bodies. Had that been the cafe, it is evident that from their very delicate texture they muft have been frequently fubjected to much violence from the force with which many bodies are often applied to them.

The pfychological caufe is the faculty of attention: by its active powers all impreffions of

of external bodies are either rendered vivid, or are impeded in their operation on the mind upon principles, which we perhaps ſhall never be able fully to comprehend. If on the one hand our attention be wholly directed to the objects which ſtrike our ſenſes, the nervous impreſſion not only ſeems to be more acutely felt, but the repreſentation in the mind ſeems alſo to be ſo much the more complete and accurate. On the other hand, if it be already engaged by any object of thought, the impreſſions of external bodies fail to produce their due mental effect. A perſon who is thus occupied, may ſtare his neareſt friend in the face, and paſs him, as if he was unknown to him. If, in peruſing a work of ſcience, or genius, our mind is led aſtray to a diſtant train of abſtract thought, we may continue to read, and yet not underſtand one word of the book. The words are ſeen, they make a full impreſſion on the eye, and that is conveyed to the brain, but it does not ſeem to affect the mind. That it is conveyed to the brain is evident from this, that if the perſon was reading aloud, he ſhall continue to pronounce the words,

words, and yet, if ſuddenly ſtopt, he does not recollect one word of what he has ſeen. Many external bodies are made up of parts, which are extremely different from each other in form, ſize, colour, denſity, and a variety of other phyſical properties, which are calculated to affect our ſenſes. Each of theſe parts may be conſidered as a diſtinct object of repreſentation. The more completely, then, that the ſeveral parts and phyſical properties of any object are repreſented in the mind, the more perfect will the general repreſentation of that object be.

It is juſtly and acutely obſerved by my friend, Dr. MARCUS HERZ, in his celebrated work on Vertigo, that a certain portion of time is required before an external body is duly repreſented in the mind. If a number of objects paſs quickly before our eyes, or a number of ſounds rapidly ſucceed each other, we have but an imperfect repreſentation of them; they have not ſtaid long enough in the mind to be fully felt as it were.

As the faculty of mental perception is an active one, and operates on the impreſſions received by the ſenſes, a certain portion of time, however ſhort it may be ſuppoſed to be, is always neceſſary for its due accompliſhment. If external impreſſions ſucceed each other too rapidly, this kind of mental aſſimilation cannot take place, and a crude and defective idea is the conſequence; hence a perſon who ſees an unknown animal, or a complex piece of architecture, only for a ſhort time, has a very imperfect knowledge of them; the more remarkable parts only are attended to. A perſon who is capable of painting from memory, will make a more exact reſemblance of any thing which has a number of parts, after he has ſeen it ſeveral times, than he could poſſibly have done had he only ſeen it once or twice; and hence we ſee the reaſon why people have a more accurate recollection of ſubjects connected with their favorite purſuits, or ſtudies, than with thoſe which they have not been accuſtomed to contemplate.

It

It is evident, then, from what has been already ſaid, that our knowledge of complex bodies will be more or leſs complete, in proportion to the number of their parts and qualities repreſented in our mind. Of thoſe which are calculated to affect ſeveral of our external ſenſes, our knowledge muſt be ſlowly gained, ſince a certain portion of time elapſes in attentively examining all the impreſſions which ariſe from them.

Our knowledge of bodies is often counteracted by cauſes which it is not in our power to remove. If the organs of external ſenſe are weak, or faulty, a number of parts may not only eſcape obſervation, but even if they do engage attention, they are not accurately repreſented. Diſtance may operate in the ſame way, for it conceals from us a number of the minuter parts of the body.

There is a term borrowed from the Greeks, employed by DESCARTES, LOCKE, HUME, BERKELEY, and moſt of our beſt metaphyſicians, which is nearly of an equivalent ſigni-

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fication with the expreſſion, mental repreſentation; the word alluded to is *idea*. Dr. Reid rejects this expreſſion on account of the abſurd hypotheſis already mentioned, with which it was connected, and in its place he ſubſtitutes the term *notion*. Theſe terms are uſefully employed in a ſenſe nearly equivalent to that of mental repreſentation, in caſes in which it would appear affected to make uſe of this laſt expreſſion. It is more natural to ſay that a perſon has an idea, or notion of virtue, courage, honour, charity, benevolence, and gratitude, than to ſay that he has a repreſentation, or perception of them. Although theſe words are ſuppoſed to expreſs certain abſtract qualities of mind, rather than any thing which is corporeal, yet a little reflection will ſoon convince us that our knowledge of their exiſtence ariſes from external and viſible objects. According to the views of the ſociety we live in, and their particular doctrines and forms of religion, certain actions are denominated vices, while others, from promoting the ends of ſociety, and the purpoſes of religion, are called virtues. In our infancy, and as we grow up

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in life, we are taught to discriminate the one set of actions from the other, by hearing them receive the appellations mentioned. The word *virtuous*, then, is applied to conduct, or certain actions. In like manner we are taught to apply the word *courageous* to a man who fights well in battle; he who relieves the poor is said to be *charitable*; and when our words and actions are expressive of kindness to those from whom we have received a benefit, we are told we are *grateful*. Our notions, then, of these things are so far derived *ab externo*. We have a consciousness, or knowledge, however, that our own voluntary actions are excited by certain thoughts, which we call motives or principles; and as we naturally imagine that the actions of every other man arise in a similar manner, we endeavour to characterize the principles of human action by different names, and thus we call the motives which prompt a man to do virtuous actions, *virtue*; and courageous actions, *courage*, &c. Although our knowledge of these principles is originally derived from the external world, yet as they themselves are not representations

reprefentations of any individual external object, it is proper to have a different term to exprefs them. It is, moreover, to be obferved, that the word reprefentation cannot be well applied to the knowledge we have of our own thoughts, and the operations of our mind, fince it is not derived from any impreffion on our external fenfes, but from a kind of mental feeling we call confcioufnefs. In all fuch cafes, therefore, the old word idea, or intuition, is a much better term.

Dr. Reid remarks, with much juftice and ingenuity, that when our attention is directed to external objects it is called *obfervation,* and when it is directed to our thoughts alone, it is called *reflection.* The diftinction between thefe two is obvious, and hence the utility of thefe expreffions.

Although education is the circumftance which, generally, has a great and evident influence in rendering a perfon an obferver, or a man of reflection; yet we muft alfo fearch in the organization of the body, and the natural condition

condition of the mind, for the difference of character. If a number of children be attentively obſerved at the time when they firſt begin to acquire a tolerable good management of their external ſenſes, we ſhall diſcover a vaſt difference among them in this reſpect. Some are all hands, and ears, and eyes; others are naturally ſerious and thoughtful; and others dull and heavy, lumpiſh in body, and torpid in mind. In the firſt claſs the ſenſibility of nerves, eſpecially thoſe which ſupply the organs of external ſenſe, is great; every object acts powerfully on them, excites them, and keeps their attention conſtantly employed with the external world. When this ſenſibility of nerves is exceſſive, and diſproportionate to the energy of the mind, a phyſical reſtleſſneſs occurs which diſturbs all inſtruction; their attention is conſtantly withdrawn to external objects; and when they grow up in life they generally run into every ſpecies of thoughtleſs exceſs. But when it is only acute, and accompanied with an active mind, it lays the foundation for the moſt ſplendid and ſhining character. All depends, then, upon the

the mode in which attention is directed and improved; or in other words, on the education that is given them, and the conduct they are made to obferve.

The ferious and thoughtful boy has lefs fenfibility in the nerves of his organs of external fenfe, than force of mind; his attention, therefore, is more eafily excited by his own thoughts than by external objects. He is filent, abfent, and often folitary; and if this ftate be not corrected by the moft judicious management, he becomes unfit for every active commerce with the world. He may become a good and learned fcholar, aftronomer, mathematician, or metaphyfician, and may eafily excel in every abftract fcience in which the powers of the mind alone are principally required. But he makes a bad obferver, and confequently always appears to mankind at large, much inferior in talents to the generality of other people. He is inattentive to the common circumftances of common converfation, and unacquainted with the topics of it. He is a perfect book-worm, for his natural defires lead him

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on to knowledge, and his averſions make him renounce general ſociety. Between theſe two extremes there are various ſhades of mental character, ariſing from a variety of conſtitution; diſpoſing ſome, on the one hand, to exercifes of the mind, and others to exerciſes of the ſenſes. If education, and the accidental circumſtances of life do not correct theſe biaſſes when very ſtrong, terrible effects are apt to follow in the courſe of time. The mind of the one is liable to become torpid for want of due exerciſe, the principal occupation of the perſon being the employment of his external ſenſes; the mind of the other is too much exalted at the expence of the external ſenſes, and therefore the foundation is laid for a prediſpoſition to ſingular illuſions, the nature of which will afterwards be explained when the deliria to which men of genius are ſubject, are treated of.

The repreſentative faculty of the mind may be variouſly altered from its natural ſtate; and of theſe morbid alterations two may be ſaid to be idiopathic, or ſpecific, all the reſt are ſympathetic,

ſympathetic, and ariſe from diſeaſes of the external ſenſes.

The firſt ſpecific diſorder to which this faculty is expoſed, is fatuity, or idiotiſm, in which it appears that no accurate repreſentation of any external object, and no abſtract thought, or reflection, ever occurs. The phenomena by which this complaint is diſtinguiſhed are very ſtriking; a vague, unſteady, wandering eye, which is ſeldom fixed for any length of time upon any one object; a ſtupid expreſſion of countenance, in which no ſign of intelligence is pourtrayed; a gaping mouth, from which the ſaliva flows conſtantly; a perpetual rolling and toſſing of the head; no memory, no language, no reaſon. The idiot has all the animal inſtincts, and ſome of the paſſions. Of the laſt, joy, fear, and danger, are thoſe with which he is moſt frequently affected, but theſe are of a very limited kind; his joy is unmeaning mirth; his fear a tranſient qualm; his anger a momentary fit of violence: the toys of children, and the gratification of hunger and thirſt, are his only pleaſures;

pleaſures; bodily pain, or fear of bodily pain, the only ſources of his anger. It is a common opinion that idiots have not only ſtrong ſexual deſires, but alſo great powers to execute them. Whether this notion is well founded or not, I cannot take upon me to decide, having never inſtituted any experiments whereby it may be aſcertained. It is certain that thoſe who are completely fatuitous, ſeldom exhibit any deſire on the approach of the oppoſite ſex.

This diſeaſe is either congenital, or accidental; the firſt is by far the moſt frequent; the number of born idiots exceeding thoſe of the others by a vaſt proportion. A faulty conformation of the bony parts of the head, and of the brain itſelf, are generally the cauſes from which this humiliating diſorder proceeds. Of thoſe who are idiots from birth, a number are affected in the courſe of their lives with palſy, or epilepſy, ſometimes with both; a clear proof of the exiſtence of ſome organic affection of the brain or nerves. The palſy, ſometimes very partial, occupying the face only,

only; at other times the whole of one fide is affected.

There are few inftances of born idiots attaining an old age: they feldom live until they are thirty; and of thofe who are epileptic or paralytic, the greater number die before they are twenty-five. Fatuity and idiotifm may arife accidentally from a variety of caufes, which, by mechanically deranging the texture of the brain, deftroy all the operations of the mind. It is in this way that idiotifm often comes on after repeated attacks of epilepfy, fevers of bad kinds, blows on the head, and alfo as a confequence of phrenzy.

The next diforder to which this faculty is fubject is vertigo, or dizzinefs. Before the nature of this complaint can be perfectly underftood, a number of phyfiological facts muft be taken notice of, the mentioning of which has been purpofely delayed until this moment, becaufe it was imagined they would make a more forcible impreffion on the mind of the reader,

reader, from their natural connection with this curious object of inquiry.

The time required before the reprefentative faculty of the mind obtains a due reprefentation of any external object; or to exprefs one's felf in fimpler language, the time that is neceffary to examine external objects with a due degree of accuracy, is very different in different cafes. The circumftances which particularly regulate this, appear to be three in number:

1ft. The greater, or fewer number of parts, of which an object of external or internal fenfe is compofed.

2dly. The degree of attention employed during the examination of the object.

3dly. The difference in the natural *receptivity* of mens minds.

1ft. Simple bodies, and thofe which are fimilar in appearance, fuch as a feries of fimilar pillars,

pillars, or columns; a flock of ſheep, or deer; a number of ſoldiers dreſſed alike, are all quickly examined. The eye glides eaſily from the one to the other, and no unpleaſant effect ariſes in the mind in conſequence of the rapid ſucceſſion of repreſentations which occur. But when the objects are different from each other, and new to us, ſuch as a number of foreign flowers, or pictures and ſtatues, before unſeen, our attention is arreſted by each one, and it ſeems painful to withdraw our ſight from them until the eye ſhall have repoſed, as it were, for a certain time on each. This obſervation is not peculiar to external objects, for our internal thoughts are ſubject to the ſame laws; thoſe ideas which are ſimple and familiar to us, glide quickly and eaſily acroſs the mind without occaſioning any ſtrain of attention, or producing any uneaſineſs in their tranſit; but others arreſt our attention, as it were, by force, and we cannot diſmiſs them from our mind without a kind of effort, which is painful. If they are forced upon us in rapid ſucceſſion, they produce a great deal of

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mental diſorder which will be immediately deſcribed.

2dly. That the time neceſſary for obtaining a due repreſentation of any object, is regulated, in a great degree, by the attention employed, does not ſurely require much illuſtration. No man can have attained the age of reaſon without having repeatedly made the obſervation.

3dly. The third circumſtance which regulates the time neceſſarily employed by the mind in obtaining a due repreſentation, or idea of any thing, is what the Germans very properly call *receptivity*.

The word is applied to denote a fact which is hinted at in Engliſh, when we ſay that ſuch a perſon has a quick apprehenſion, or comprehenſion, and that ſuch another perſon has a ſlow comprehenſion, or apprehenſion. There is a natural difference in the conſtitution of the mind which fits it for receiving and retaining with more or leſs facility, the influence of ſenſorial impreſſions; juſt as there is a conſtitutional difference in the nerves of people, which cauſes

causes some to feel all external impressions much more acutely than others. It is to this principle that a great deal of the natural inequality which we observe in the intellectual powers of different children, and men, are to be referred. When the receptivity is great, every external object is quickly apprehended, and the most complex and abstract thoughts seem to be understood as if by intuition. Where the receptivity is weak, external impressions must be often repeated, or long continued, before the representation in the mind is complete; and abstract and complex thoughts must not only be often repeated, but reduced to all their primitive parts, and offered piece-meal, as it were, to the mind, before the person can be made to comprehend them. What we call quickness of mind, and its opposite term, dullness, are qualities, then, of its receptive powers.

There are certain ideas, and modifications of thought which our mind seizes in preference to others. Some men are painters, poets, and arithmeticians, &c. from the natural constitution of their minds, and in early youth always exhibit

exhibit a greater predilection for the peculiar objects of thefe ftudies, than for others. A bent of mind to certain branches of ftudy, rather than to others, may be acquired by habit, as well as derived from birth, as hath been fully explained in the preceding chapter; for the receptive powers are always rendered pliant by renewing the fame fet of impreffions. Although a perfon fhould find it painful at firft to fix his attention to any particular fcience, yet by perfevering, the averfion gradually wears off; and after he has made a certain progrefs in it, he at laft finds that every thing which relates to it interefts him, and his receptivity for all the thoughts connected with it, is increafed to a furprizing degree.

When mental reprefentations and ideas fucceed each other flowly, an irkfomenefs of mind takes place, which the French call *ennui*. The flownefs hinted at is neceffarily relative to the nature of the ideas. New ideas pleafe much better when they fucceed each other with a certain degree of flownefs, than when quickly prefented to the mind; but when a

perfon is confined to the houfe, and is deprived of fociety, and has no opportunity of feeing a fucceffion of new objects, and is not under the influence of any defire, or paffion, which can give rife to a flow of thoughts, he neceffarily falls into this diftreffing ftate, from the too flow fucceffion of old or accuftomed thoughts. If we have no means of efcaping from a dull, ignorant, and prolix companion, whofe whole converfation is about common place topics, and whofe thoughts have no affociation with any of our purfuits, or inclinations, we fall into a ftate of *ennui*. This tormenter of human happinefs often occafions a degree of inquietude which is productive of the moft alarming and fatal confequences; for the defire of relief becomes, in fome cafes, fo great as totally to deftroy all judgment, and confequently hurries the perfon on to the moft criminal violence againft nature. It is in this way that *ennui*, like melancholy, may terminate in fuicide. In a leffer degree, it produces a number of well-known, but no lefs remarkable phenomena; a reftleffnefs, and fenfe of wearinefs, fpread themfelves over the whole frame;

the perſon gapes and yawns frequently, his ſenſes become dull, his attention unſettled, and he at laſt falls aſleep; or if he be young and active, the diſtreſſing feelings which accompany this ſtate give riſe to a powerful deſire of relief. I have ſeen a perſon in company after ſuffering impatiently theſe kind of tortures for a long time, at laſt totally forgetting where he was, ſuddenly ſtart from his chair like a frantic perſon, walk about the room for a minute or two with a quick pace, panting for breath, as if he had not breathed freely for ſome hours before, until the expreſſions and aſtoniſhment of the people around him awakened him from his delirium, and brought him to a proper ſenſe of the indecorum he had been guilty of.

It is a favorite opinion with HELVETIUS, and many other philoſophers, that ennui is one of the moſt powerful motives in the mind of man which ſtimulates him to great actions. There can be no doubt of the general truth of this fact, only it is not quite accurately expreſſed; for it is the deſire of relief from pain,

and not the languor from which the actions ſpring.

When mental repreſentations, and ideas, croud involuntarily, and in too quick ſucceſſion, they occaſion the diſeaſe called vertigo, or dizzineſs. This is the opinion of Dr. MARCUS HERZ, with whom I intirely coincide; he defines vertigo thus: "*It is a ſtate* "*of mental confuſion, ariſing from the too rapid* "*ſucceſſion of repreſentations.*" P. 176. To this definition the word involuntary ought to be added, becauſe a ſeries of thoughts may paſs more rapidly through the mind, than thoſe which occaſion vertigo, and yet no ſuch diſeaſe follow; as happens often in the caſe of quick reading, and where we are under the neceſſity of recollecting, ſuddenly, a number of paſt events; and alſo when we are under the influence of certain paſſions, ſuch as anger.

The ſymptoms of the diſeaſe are theſe: external objects appear in a rotatory motion, revolving either horizontally from right to left, or *vice verſa*; or perpendicularly from above

above downward, or from below upwards. It frequently happens at the ſame time, that the perſon ſeems as if his own body was in motion, and that generally in a contrary direction to the apparent motion of the objects. Double viſion, and ſudden changes of the colour of bodies, are alſo frequently ſeen by vertiginous patients. The perſon ſtaggers, a paleneſs overſpreads the countenance, the pulſe becomes ſmall and quick, viſion dim and obſcure, the muſcles which ſupport his body give way, and he falls down. Dr. HERZ enumerates a number of other ſymptoms, which he reduces under ſo many heads; but it appears to me that thoſe already mentioned are the only ones which are general and common to all kinds of vertigo. Thoſe which remain to be mentioned ariſe in particular caſes, according to the nature of the cauſes which produce it, and other morbid affections which accompany it.

It has been ſaid that vertigo conſiſts in an involuntary rapid ſucceſſion of repreſentations

or ideas. The exciting caufes are various, and are either external or internal.

The external ones are, 1ft. the being placed in fuch fituations that we cannot judge whether we preferve our natural pofture or not, as when we are obliged to walk along a narrow board, fufpended high over a river, or chafm, and having no fafeguard on either fide; or when we direct our eyes down a precipice, or from any great height; or, 2dly. when external objects are made to revolve rapidly before our eyes; and, 3dly, they are fuch difgufting objects as upon being viewed excite naufea.

The manner in which the firft clafs of external caufes operate is well imagined, and defcribed by Dr. Darwin. He thinks with juftice, that we preferve our upright pofture by a fpecies of judgment. "In learning to "walk," he fays, "we judge of the diftance "of the objects which we approach by the "eye; and by obferving their perpendicularity "determine our own." The human body cannot preferve an upright pofture without a conftant

conſtant exertion of the muſcles of voluntary motion, as is evident from its falling down, or ſtaggering, when volition is ſuſpended or impeded. If by a falſe ſtep we are thrown a little out of the perpendicular poſture, we immediately obſerve it by the apparent alteration which occurs in the ſituation of the bodies around us; and we know we have recovered our former attitude when we diſcover them to be in an erect poſture alſo, or in the one in which they naturally appear to us while we ourſelves are erect. Now if the objects which govern us, therefore, in this matter, be regulated in any manner which we have not been accuſtomed to, or are ſo far withdrawn from our ſight, that they no longer ſerve as guides by which we can regulate our poſtures, we immediately begin to ſtagger. No perſon who is blind-folded, or who is in ſuch a ſituation where the objects around him are in an unuſual motion, as on board of ſhip, can preſerve his poſture, for as ſoon as he feels himſelf begin to ſtagger, he endeavours, by the exertion of thoſe muſcles which ſupport him, to recover his poſture; and as this is ſel-

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dom accomplifhed at once, and when accomplifhed is only preferved for a few moments, the vibration of his body increafes the apparent motion of the furrounding objects, their reprefentations pafs quickly, and in diforder acrofs his mind, and he becomes vertiginous. Many people are feized with vertigo from feeing a large wheel revolved near to them. Their propinquity to the object, and its largenefs, are, in fome refpects, neceffary conditions for the production of this effect; for by this means the perfon is prevented from feeing objects which are at reft. In like manner, many people become vertiginous from feeing a body in confufed motion near them; and this explains the fecret of that myfterious influence, called animal magnetifm. It is well known that many people faint in confequence of being magnetifed. The magnetifers withdraw the attention of the perfons from the objects around them by means of various and fudden motions of the hand, made almoft clofe to the eyes of the perfon. Thefe manipulations confift in a number of fudden jirks and rotatory movements of the hand, and alfo in

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closing and expanding the fingers quickly before the eyes of the patients; hence they lose the sight of all the objects in the apartment which are at rest, and consequently lose the command of attention to their own thoughts; they therefore become dizzy, in the manner which I have described. I will venture to assert, from what I myself have experienced under the trials of MESMER's disciples, that if the attention be strongly employed, either upon some distant object which is at rest, or what is much better, with one's own thoughts, such as family concerns, or the remembrance of absent friends, no vertigo, or fainting, hysteria, or convulsions, or any other disease, which the magnetisers choose to call a *crisis*, will ensue.

Vertigo is very frequently accompanied with a loud noise in the ears like that of a torrent falling over a precipice. This symptom is common in the vertigo which arises in consequence of intoxication, and in that which precedes apoplexy. It appears to me that it may always be accounted for in the following manner: when the blood is determined to the head

head in greater force than usual, the vibrations it communicates to the petrous portion of the temporal bone, are always heard, and when they are thus heard, they constantly recall to our recollection the sound of the rushing of waters. There is another kind of tinnitus aurium, or noise in the ears, which is peculiar to the vertigo of nervous people, and those who are about to faint. It consists of a number of quick concussions, of a metallic sound, and is compared to the ringing of bells. This, I believe, constantly arises from a convulsive motion of the muscles of the *malleus*, by which it is thrown into repeated actions. This conjecture arises from the well known fact, that it often precedes epilepsy, and hysterical paroxysms. It is also often heard by nervous patients when agitated, or affected by cold, indigestion, or such causes as bring on in them slight spasmodic affections. Dr. DARWIN explains this curious circumstance in a different manner, which is consistent with his general doctrine, but which may be said to be a very round-about way of accounting for the phenomenon.

"During

" During our waking hours," he ſays, (Vol. I. p. 234,) " there is a perpetual confuſed " ſound of various bodies, as of the wind in " our rooms; the fire; diſtant converſations; " mechanical buſineſs; this continued buzz, " as we are ſeldom quite motionleſs, changes " its loudneſs perpetually, like the ſound of a " bell, which riſes and falls as long as it con- " tinues, and ſeems to pulſate on the ear. " This any one may experience by turning " himſelf round near a water-fall, or by ſtrik- " ing a glaſs bell, and then moving the direc- " tion of its mouth towards the ears, or from " them, as long as its vibrations continue. " Hence this undulation of indiſtinct ſound " makes another concomitant circle of irrita- " tive ideas, which continues throughout the " day.

" We hear this undulating ſound when we " are perfectly at reſt ourſelves, from other " ſonorous bodies beſides bells, as from two " organ pipes, which are nearly but not quite " in uniſon, when they are ſounded together. " When a bell is ſtruck, the circular form is

" changed

" changed into an elliptical one; the longeſt " axis of which, as the vibrations continue, " move round the periphery of the bell; and " when either axis of this ellipſis is pointed " towards our ears, the ſound is louder; and " leſs when the intermediate parts of the " ellipſis are oppoſite to us. The vibrations " of the two organ-pipes may be compared to " NONIUS's rule; the ſound is lower when " they coincide, and leſs at the intermediate " times. But, as the ſound of bells is the moſt " familiar of thoſe ſounds which have a con- " ſiderable battement, the vertiginous patients " who attend to the irritative circles of ſounds " above deſcribed, generally compare it to " the noiſe of bells."

It muſt be evident to every one that Dr. DARWIN, in the above paſſage, wanders conſiderably from the principal points of inquiry; for it was ſurely unneceſſary to enter into an elaborate diſcuſſion of the cauſes which occaſion the undulation of external ſounds, when all that he wanted was to prove, that, as the ſound of a bell is moſt familiar to us, vertiginous

ginous patients referred the noiſe in their ears to it. The cauſes which produce this peculiar noiſe in the ears, and which is referred to the ſound of a bell, he does not inquire into.

The external, exciting cauſes of vertigo, are various, and of various origin; ſome are intirely mental. A perſon who is but ſlightly acquainted with any ſubject which requires a conſtant and powerful attention to be underſtood, ſhall become vertiginous from hearing another perſon ſpeak too quickly on the ſubject. I know a lady of a very delicate frame, and of very excellent natural powers of mind, but not much accuſtomed to abſtract thought, who, if ſhe hears a long chain of reaſoning, quickly delivered, conſtantly becomes vertiginous. In ſuch caſes, the attention is powerfully exerted at firſt, in order to apprehend, diſtinctly, every thing that is ſaid; and the thought not being familiar, there is an effort to retain each of the ideas as they are delivered; while, on the other hand, the volubility of the perſon ſpeaking preſſes new ones on her mind, before ſhe can diſmiſs thoſe ſhe was examining.

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In this manner attention is at laſt ſo far weakened as to act irregularly, and the ideas are then crowded involuntarily on the mind, and a momentary giddineſs, and abolition of thought follows. As vertigo is often a mere ſymptom of apoplexy, epilepſy, ſyncope, and hyſteria, it is evident that its cauſes may be nearly as various and numerous, as thoſe which give birth to theſe diſeaſes. Many of them are to be ſought for in the ſtomach and inteſtines; wind ſuddenly diſtending that organ; indigeſtion, food remaining too long in it, and any error in diet, either in regard to quantity or quality. This is the reaſon why hypochondriac and hyſterical women are ſubject to vertigo; worms in the inteſtines alſo occaſion it.

The way in which corporeal cauſes may be ſuppoſed to act is this: the nervous impreſſions being of an unuſual and powerful kind, prevent the action of impreſſions *ab externo*: the principle of aſſociation is interrupted by the obſcure corporeal impreſſions alluded to, and hence there is an irregular flow of ideas, and

and an irregular action of attention; but this being once accomplished, it is exactly the same as if a new series of representations and thoughts presented themselves involuntarily, rapidly, and in a confused manner to the mind.

Women are much more liable to this disease than men; and old people of both sexes are oftener affected with it than the young or middle aged. Women who are exhausted, from giving suck too long, or who are too weak to support the waste of fluids occasioned by it; people weakened by excessive evacuations, or hæmorrhages; and young people addicted to the destructive practice of self-pollution, are peculiarly subject to this disorder. Dr. Herz tells us that he once had the medical treatment of a young man, who in consequence of this baneful habit had induced such a morbid sensibility of nerves, that he could not hear any person speak with a moderate degree of quickness, for any length of time, without being affected with vertigo. P. 329.

Independent of these diseases, mental perception is often altered from its natural state by

by various diſorders of the organs of external ſenſe; for if impreſſions *ab externo*, are altered in their paſſage to the brain, a new character is given to the repreſentation of the mind. If, for inſtance, by any accident, a perſon becomes incapable of directing his eyes to any object, as he was formerly wont to do, the mind receives the impreſſions of the two eyes as two new impreſſions, and each, therefore, makes a repreſentation, and the perſon conſequently ſees double. Thoſe whoſe organ of ſight is ſo conſtructed that they cannot ſee diſtant objects diſtinctly, neceſſarily loſe a number of perceptions, which other people who ſee more acutely would receive from ſuch objects; and in this reſpect the faculty may be ſaid to be defective: tinnitus aurium, or noiſe in the ears, diſeaſes of the ſenſe of touch, of taſte, and ſmell, as they give riſe to unuſual impreſſions, may alſo become the cauſes of diſeaſed perception.

CHAP-

CHAPTER IV.

ON MEMORY, AND THE ASSOCIATION OF IDEAS, AND THEIR DISEASES.

Memory defined. Difference between recognition and recollection. The value and meaning of other terms examined. Recollection dependent on association of ideas. The principles of association which have been ascertained by Mr. HUME *taken notice of. The criticisms of* Lord KAIMES, Dr. GERARD, *and* Mr. STEWART, *stated and criticised. The* Abbé CONDILLAC *mentions a principle of association unobserved by* Mr. HUME. *Memory affected by corporeal causes. How this is to be explained. Objects of memory.* HALLER'S *hypothesis of memory.* Mr. LOCKE'S *opinion, and that of* Mr. HOOK, *stated and examined. The difference of memory in different individuals. Instances of uncommonly quick and retentive memory. What the causes are which strengthen this faculty. Memory may be impaired, and abolished by a great number of causes. The causes mentioned, and methodically arranged.*

Cafes brought forward to elucidate their effects. A peculiar fpecies of vefania depending on the principles of affociation, defcribed and explained.

THE word memory denotes that faculty by which ideas are retained in the mind, independent of the caufe which firft produced them. There are two ways in which it exhibits its influence and properties. The one is a very paffive act in comparifon with the other. It is called *recognition*, a word derived from the Latin expreffion *recognofcor*. By its means we are made confcious that objects, either of thought, or of external fenfe, which are accidentally renewed, have formerly been prefent to our mind or fenfes. As, for inftance, when a perfon hears an anecdote which he has formerly heard, or meets a perfon he has often met before, he then becomes immediately confcious that he had a prior knowledge of them.

The other is a very active procefs, which confifts in an effort to recal a former perception,

tion, part of which only is prefent to our mind, as, for inftance, when a perfon is defired to recollect all the particulars of a converfation he had with another fome time back; or when a perfon is afked what the contents of any book, or effay are, &c. When this procefs goes on eafily, we are feldom confcious of the voluntary exertion we make ufe of on fuch occafions; but when the things are recollected flowly, and with difficulty, as we call it, we are all confcious of it. Indeed the exertion, or effort, often produces, when long continued, a very unpleafant fenfation about the forehead, which fometimes terminates in head-ach. This active procefs of the mind has been denominated reminifcence by Dr. REID, and others; but HARRIS calls it recollection. The latter term ought to be preferred, becaufe it is evidently derived from the Englifh verb to recollect, which is in daily ufe to exprefs the action of this faculty of the mind; whereas we have no verb related in a fimilar manner to reminifcence, for the verb to remember is applied indifcriminately both to the active and paffive operations of memory.

The act of *recollection* is intirely dependent on the aſſociation of ideas. In order to recollect any thing, one link of the chain of ideas connected with it muſt be preſented to the mind. Suppoſe a perſon is aſked where he was at ſuch an hour, on ſuch a day; the name of the hour and day contained in the queſtion are ideas aſſociated in his mind with a vaſt variety of events, many of which muſt be recollected before he can give an explicit anſwer to the queſtion. If any thing happened at the time which made a ſtrong impreſſion on his mind, that circumſtance is immediately recollected as ſoon as the day and hour are mentioned; but if this is not the caſe, the perſon will probably be under the neceſſity of recollecting all that he did from the time when his daily avocations began, until that hour, and alſo many things he did after it, before he can exactly remember the particular event alluded to. He may alſo be obliged to recal to mind what he did at a ſimilar hour for ſome days, both before and after the one mentioned.

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The doctrine of the affociation of ideas is at prefent fo generally admitted by all philofophers, that it is deemed unneceffary in this work to employ much time in illuftrating the fact; but, as the fubject is intimately connected with that of memory, and as there are one or two phyfiological facts concerning it, which the medical ftudent ought to be acquainted with, thefe fhall be taken notice of and difmiffed, in order to avoid interruption afterwards.

Whoever will patiently examine what goes forward within himfelf, during various acts of recollection, will be convinced that the ideas which are affociated together in his mind, are not all connected in a fimilar manner. Some appear to be connected becaufe they happened to make an impreffion on one or more of his fenfes, at, or nearly at, the fame time. Thus, when we think of any fine picture, which once ftrongly engaged our attention, we recollect the moft of its various parts, the particular view, or action, that was reprefented; the mode of affemblage, among the figures,

figures, their form, their ſize, their colouring, and the general effect the picture produced on our imagination, with the judgment we formed of it, the painter who painted it, the place where we ſaw it, and thoſe who were with us at the time. In other inſtances the principle by which the aſſociation of our ideas ſeems to us to have been regulated, is the relationſhip which we imagine exiſts between a cauſe and effect. We cannot ſee an inſtrument of puniſhment without thinking of the pain it inflicts; if a ſudden light ſtrikes our eyes, we look around for a luminous body; if we ſee a flaſh of lightning, we expect to hear thunder.

The very celebrated Mr. HUME has endeavoured to reduce all the principles of aſſociation under three heads, *reſemblance, contiguity,* in time and place, and *cauſe* and *effect*; but Lord KAIMES in his Elements of Criticiſm, and Dr. GERARD in his Eſſay on Genius, Dr. Campbell in his Philoſophy of Rhetoric, and Mr. STEWART, in his Philoſophy of the Human Mind, think that there muſt be other principles of aſſociation admitted than theſe, and

and they consequently assert that Mr. HUME has generalized the subject too much. The instances, however, of particular associations, which they adduce in support of their criticism, are extremely scanty. The compiler of the article Metaphysics, in the Encyclopedia Britannica, who is also of opinion that Mr. HUME has not mentioned all the causes by which the association of ideas is regulated, has condensed the arguments employed by the authors just now mentioned; and he states in a few words all the facts which seem to stand in opposition to Mr. HUME's opinion. After explaining this author's hypothesis, he says, "But surely ideas sometimes succeed each "other without *resemblance*, without *contiguity* "in time or place, and without being con-"nected by the relation of a *cause* to its *effect*. "Besides all this, there are other associations "than those of *ideas*. Ideas are associated "with passions, and emotions, and passions "and emotions are associated together. A "particular idea is associated with a proper "name, and often with the general name of "the species. General conceptions, such as

"those

" thoſe which Mr. Locke calls mixed modes, " are aſſociated with ſigns both audible and " viſible, and ſigns are aſſociated with each " other. Surely virtue, as it conſiſts in action " and intention, does not reſemble the *ſound* " virtue, is not *contiguous* to it in time or " place, and is neither its *cauſe* nor its *effect*; " nor is it conceivable that the arbitrary ſigns " of different things ſhould have any natural " relation to one another." Vol. XI. part 2. p. 513.

Theſe objections, when duly conſidered, will be found to have infinitely more apparent than real force. It is to be remarked, in the firſt place, that Mr. Hume confines his obſervations to the aſſociation of ideas alone, and as it is probable that he ſaw in a clearer light than what his critics ſeem to have done, that the aſſociation which takes place between many paſſions, and between paſſions and emotion, was of a very different nature from that which takes place between ideas, he very judiciouſly took no notice of them. Theſe curious phenomena in our ſyſtem depend on principles very

very different from thoſe which regulate our ideas. Every paſſion has its emotions, as every diſeaſe has its ſymptoms. The relationſhip which exiſts between them is ſimilar to the general one of a cauſe producing its peculiar effect. If an emotion follows a paſſion, or accompanies it, it does not do ſo on the principle of an aſſociation, but on one which reſembles the motion of a body when impelled by another; but this matter muſt, at preſent, be laid aſide, as it is out of order. In the chapter which treats of the paſſions in general, it ſhall be more fully explained.

The next objection, that the aſſociation of ideas and paſſions may be conſidered as a proof that Mr. HUME has generalized too much, is ſubject to nearly the ſame remarks. The word paſſion is often indiſcriminately applied, not only to the motives, but alſo to the actions of an impaſſioned man. When we ſee a perſon become diſturbed in his whole frame, and direct offenſive expreſſions againſt another; when we ſee him clench his hands, and, as if impelled by ſome irriſiſtible power, commit acts

acts equally unreasonable and injurious, we say that man is agitated with anger. In saying so we allude both to the state of his mind, and also that of his body. If Mr. HUME's critics refer to the association between the ideas and the bodily actions, as there is some reason to think they do, seeing that they also consider the association between ideas and words, (which are bodily actions) as an objection to his hypothesis, they would have done well to have examined this matter a little more narrowly, before they had published such a thought. All ideas which are followed by voluntary actions, produce their effect by exciting a peculiar principle called volition. The impulses of this, according as they are directed to particular sets of nerves, are transmitted along them, and when they reach the muscular parts, throw them into action, as many other physical causes do. Surely, then, there is no similarity between this chain of causes and events, and that which associates ideas together in our mind: one might as well have expected that Mr. HUME should have explained, by the principles he has laid down, the association between a flash of

of lightning, and the noiſe of thunder; between the throwing a ſtone up in the air, and its deſcending to the earth; as the aſſociation between words and their external ſigns, or between the motives of any paſſion, and the actions of the ſame. If Lord KAIMES, Mr. CAMPBELL, and Mr. STEWART, allude to the aſſociation which takes place in the ideas that excite a paſſion, and thoſe which urge a perſon to commit certain actions, the alluſion is juſt and pertinent; but this does not ſeem to be what they have meant, for the greater the number of caſes of this kind which are examined, the ſtronger will the proof be in favour of the ingenuity and truth of Mr. HUME's remarks. Suppoſe, in the caſe already mentioned, that the perſon's anger had been excited by ſome opprobrious epithet having been applied to him; the queſtion, then, is whether the train of ideas, which follows that word in his mind, is, or is not, an exception to thoſe general rules of aſſociation which Mr. HUME has endeavoured to eſtabliſh. I will venture to aſſert that in every caſe in which a paſſion, (no matter of what kind it be) is excited by a word,

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the ideas which paſs through the impaſſioned perſon's mind are all aſſociated, in the firſt inſtance, on the principle of *contiguity* of time, except that word be cavilled with, as applied to time; for quantities of time can only be in ſucceſſion, not in contiguity, like ſpace; but putting the impropriety of the expreſſion aſide, it will be found that no words, or epithet, calculated to excite paſſion, can be employed, which will not bring into the mind the ideas we have been taught to aſſociate with them. If a perſon is rouſed to anger by being called a ſcoundrel, it is not from any ſpecific virtue in the ſound of this word, but becauſe he has formerly been taught what that word means. He has been told in early youth, that it is one which reflects on his character, not only as a moral agent, but as a man of honour; if he does not underſtand theſe expreſſions; they alſo are explained to him. He is made to comprehend, that, if ſuch an epithet be publicly applied to him, it muſt affect his deareſt intereſts in ſociety; and he is further taught, that no man ought to receive it without reſent-

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ing it. Theſe thoughts are aſſociated in his mind on the ſame principle that a man recollects the various parts of a play which he has ſeen or heard, or the various objects which he ſaw on a journey. They follow each other in a regular ſucceſſion at the time they are preſented to his mind, and are united by the attention paid to them at that time. When one ariſes they all ariſe, except ſome caſual occurrence breaks the connection. The ideas, therefore, which ariſe in an angry man's mind, are all aſſociated, in the firſt place, on the principle of "*contiguity of time.*"

All the principles of aſſociation already mentioned, are accidental, and may be called natural ones. There is another, however, which ariſes from an act of volition, and which Mr. HUME, and his critics, do not ſeem to have taken notice of, and which may be called an artificial one. In the fourth volume of the Cours d'Etude of the celebrated Abbé CONDILLAC, entitled *l'Art de Penſer*, this principle of aſſociation is merely ſtated as one which is different from the accidental ones; and although

though he enters into a full inquiry concerning the nature and influence of theſe in that maſterly manner which is peculiar to him, yet he leaves the other unexamined.

Although by the laws of aſſociation already mentioned, perceptions which have been received at the ſame time, and thoſe which followed each other in a regular ſucceſſion, are generally connected in our mind, yet it would appear that we often detach a perception, or idea, from theſe alliances, and give it a place either among an old aſſemblage of ideas, or with a new combination of them. The power we poſſeſs of thus ſeparating any idea from its ancient allies, as it were, and giving it a new place, is referred to a faculty called *abſtraction*, which is the architect of all ſcientific arrangement, and one of the parents of original genius. When a ſcientific fact is accidentally mentioned, or read of, it is withdrawn from the extraneous matter with which it is aſſociated in time and place, and is claſſed by the man of ſtudy among thoſe ideas in his mind, to which it is ſcientifically related. If in the mixed converſation

ſation which takes place in large ſocieties, the hiſtorian, the aſtronomer, or the naturaliſt, hear of any fact, or facts, which regard their peculiar ſtudies, do they not endeavour to aſſociate them in their minds with others belonging to the ſame branch of ſtudy rather than with the converſation which either preceded, or followed it? It is on this principle that a perſon often in the courſe of general reading, and general converſation, acquires uſeful additions to many of the branches of knowledge with which he is acquainted. Again; by a voluntary effort we often detach old perceptions from thoſe with which they were originally combined; and by giving them new ſituations, we form new modifications of thought. This is the other parent of genius, and of the art of compoſition. It will come again under our review, and will then be paid more attention to than what can be done at preſent. It muſt be evident that whether we ſeparate any thought from thoſe which are accidentally connected with it in diſcourſe, or in writing, and give it a ſcientific aſſociation; or whether we detach an old one from thoſe with which it

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was formerly claſſed, and do the ſame thing with it, that this new aſſociation which takes place is very different from any of thoſe which fall under the influence of the principles laid down by Mr. HUME.

Enough has been ſaid concerning the aſſociation of ideas to prove its exiſtence and influence; we return, therefore, to conſider the nature of memory.

Many are of opinion that this faculty depends on a mechanical property of the brain. They think that the impreſſions which external bodies make on our ſenſes, leave a veſtige in the brain, and that theſe marks, or veſtiges, are the objects of memory. Baron de HALLER, in his Phyſiology, declares himſelf to be of this opinion, in words which cannot be miſunderſtood. "Eas mutationes in ſenſorio "conſervatas *ideas* multi, nos veſtigia rerum "vocabemus, quæ non in mente ſed in ipſo "corpore, et in medulla quidem cerebri ineffabili modo incredibiliter *minutis notis* et copia infinita inſcriptæ ſunt." Although the celebrated

celebrated Mr. Locke generally expreſſes himſelf in figurative terms when explaining pſychological facts, yet in his Theory of Memory he alſo ſeems decidedly to have been of opinion, that the impreſſions of external objects made mechanical marks on the brain. "There ſeems," he ſays, "a conſtant decay "of all our ideas, even of thoſe that are "ſtruck deepeſt. The pictures drawn in our "mind are laid in fading colours. Whether "the *temper of the brain makes this difference,* "*that in ſome it retains the characters drawn on* "*it like marble, in other like free-ſtone, and in* "*others little better than in ſand,* I ſhall not "inquire."

Dr. Robert Hook, one of the firſt inſtitutors of the Royal Society, and a moſt ingegenious man, entertained a ſimilar opinion concerning memory. Indeed he goes a great deal farther than Locke or Haller, for he endeavours to tell us how they are formed in the brain, and how many hundred can be fabricated in a day.

By theſe hypotheſes we are to ſuppoſe that a kind of figure, image, or picture, of every body which affects our external ſenſes, is impreſſed, as it were, on the brain, where it remains, and conſtitutes an idea, and becomes an object of memory. Concerning that part of the brain which receives this indelible mark, there is a variety of opinions. Some think it is in the center, others in the cerebellum, and others think the whole brain is capable of becoming the ſeat of ideas. Although there is much diverſity of ſentiment in regard to this ſubject, yet there is one reflection in which all muſt coincide, which is, that all external objects which affect any one ſenſe, muſt leave their veſtige on the ſame ſpot, and this muſt have ſome correſpondence with the origin of the nerves which ſupply that ſenſe. All ſounds, for inſtance, muſt make their impreſſions at the origin of that portion of the auditory nerve called *portio mollis*. But is it conſiſtent with reaſon to imagine that ſome thouſands of different ſounds ſhould each of them leave a diſtinct mechanical trace on ſo ſmall a portion of medullary matter? But this is not

not the firft difficulty; a greater one is to comprehend how every fucceeding impreffion does not deftroy the mechanical veftige of the firft, feeing that all the impreffions conveyed by any one nerve, muft fall on one point. Suppofe a perfon attends a concert of mufic twice a week, for fix months, and during the reft of the time is as much engaged in converfation as the generality of idle men are, how many millions of veftiges muft be imprinted on that part of fuch a man's brain which correfponds with the auditory nerve. Of thefe millions he recollects fome thoufands, for every word has a diftinct found; and if he be acquainted with two or three modern languages, he may have often heard two or three founds for every word. All thefe are to make mechanical marks at the extremity of the *portio mollis* of the nerve alluded to! Independently of thefe, the optic nerves, and nerves of the fkin, are alfo conveying thoufands of impreffions, which can be recollected. One would imagine that however minute each veftige was, yet as it is afferted to be a mechanical derangement of fome of the particles

of the brain, ſome difference would be obſerved between the brain of a man of learning, and that of a very ignorant man. But no ſuch thing is to be ſeen.

Every one who reflects with attention on what goes forward in his own mind, muſt be conſcious that thoſe affections which are called mental perceptions, are the objects of memory. We are naturally inclined to believe that mental perceptions may exiſt in the mind after the nervous impreſſions, which gave riſe to them, ceaſe to act. But we certainly are not authoriſed to draw ſuch a concluſion. To aſſert this concerning mind, preſuppoſes ſuch an intimate acquaintance with it, as we know from experience no human being poſſeſſes; and yet it ſeems contradictory to human reaſon to believe that a mental perception ceaſes to exiſt, or to be any thing except at the moment it is excited, or renewed, which muſt be the caſe if that poſition be true. Although the knowledge we have of the brain and its properties forbid us to believe that it is the ſeat of memory, or that perceptions are veſtiges which

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remain in it; yet there is no reaſon why we ſhould ſuppoſe that that ſomething, called mind, which I have endeavoured to prove is totally diſtinct from brain, ſhould not have the faculty of retaining perceptions, whatever theſe are. If they were not ſomehow retained, it would be difficult to explain how we could diſtinguiſh the recollection of any thing from the firſt impreſſion of it.

Thoſe who explain memory on the mechanical principle of veſtiges made in the brain, flatter themſelves that this doctrine is corroborated by the well-known facts, that its powers are altered, and often totally deſtroyed by bodily diſeaſes. Memory is impaired in almoſt all febrile diſeaſes whatever, and WEPFER mentions many caſes of a ſimilar effect from hæmorrhages. Every phyſician of any experience muſt have obſerved how much the powers of memory are diminiſhed in palſy, and after apoplexy. It often becomes extremely defective alſo in very old age. On the other hand, patients who have loſt their memory after fevers, for the moſt part gradually

ally recover it as their health returns. In many cafes of hyfteria, ftomachic complaints, and chronic weaknefs, in which the memory has been impaired, ftrengthening, or tonic medicines, as they are called, often give it its priftine powers ; hence the ufe of cold bathing, valerian, bark, moderate exercife, and country air, in fuch cafes as thefe. Now it is faid that all fuch inftances evidently prove that memory is a mere corporeal affection, feeing that it is impaired, and renovated by phyfical caufes. This, however, is neither a fair logical deduction, or neceffary confequence from fuch premifes.

The phenomena of memory, like thofe of all the other faculties, require a healthy ftate of brain, in order to become confpicuous. Each idea as it is renewed, excites the fenforial impreffion, or impreffions, which gave birth to it ; but if the brain is not in a ftate fit to undergo this kind of change, it is evident that all figns of memory muft fail ; for through the brain and nerves alone can thefe impreffions be tranfmitted to the organs of

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ſpeech, which are ſtimulated by theſe nervous impreſſions to the utterance of thoſe words, or ſounds, which in our infancy we were accuſtomed to aſſociate with our ideas. The reaſon why a perſon, after fevers, and after palſy and apoplexy, therefore, has his memory often impaired, and ſometimes aboliſhed, is becauſe the brain is ſo diſorganized as not to receive impreſſions either from the mind, or from the external ſenſes, in the healthy manner it formerly did. It does not, therefore, follow that our ideas are retained in the brain in a mechanical manner. Such facts only prove that the ideas, when they are renewed in the mind, do not produce their ſenſorial effect.

As to the uſes of this faculty, they are as evident, and univerſally acknowledged to be highly important. Memory is the ſtorehouſe of all our knowledge, in which are accumulated every variety of thought which can either ennoble or debaſe man. His language, his ſcience, his moral doctrines, and the tenets of his religion, the good and bad actions of his life; his attachments and endearments; his cares,

cares, and caufes of anxiety; the viciffitudes of fortune he has experienced; the conceptions and plans he has formed, and their failure, or fuccefs, are all treafured up in this faculty. To memory we are indebted for many of our pureft pleafures, and many of our moft acute pains. The gay fcenes of our youth, the good actions we have done; the praifes we have juftly merited; the endearments of friendfhip; the prodigies of nature and art we have feen in diftant lands, all thefe things when recollected in happy moments of eafe and comfort, rekindle our imagination, and caufe it to glow as it formerly did, when thefe pleafures were firft experienced. In like manner the recollection of the evil actions of our paft life inflict on us, afrefh, the pains of repentance and remorfe; we cannot think without the moft diftreffing fenfations, of the acts of ingratitude which have been formerly fhewn to us, or of the neglect and mortification we met with from thofe in whom we hoped to have found a benefactor, or friend; the difappointments in our deareft wifhes, the misfortunes of our friends, their abfence, and their

their death, are all remembrances which ſink us in painful grief.

The power of memory is different in different individuals. In ſome it is not only quick, but alſo retentive to a very remarkable degree. The following inſtance of this kind of memory is related by a Mr. MOUCHART, in Vol. VII. of the Pſychological Magazine. It is that of a blind girl, who loſt her ſight when very young, owing to the ſmall-pox, which ſhe had in a very dangerous manner.

" The child," ſays Mr. MOUCHART, " ſoon " gave proofs of her being endowed with ſu- " perior mental powers, eſpecially that of " memory. When ſhe went to ſchool ſhe re- " quired to have her leſſon only once read " over to her, and then ſhe knew it perfectly. " She could alſo at that period repeat the long- " eſt ſongs, although ſhe only heard them " once.

" She goes to church regularly, and upon " her return home can repeat the whole of the " ſermon,

"sermon, with all the different passages of
"the bible which were quoted by the clergy-
"man, and the various chapters and verses to
"which he referred. Her memory is equally
"retentive as it is quick. Her mother took
"her once to Stutgard, to hear a celebrated
"preacher, and after she returned home she
"repeated the whole of the discourse. A
"year afterward she was asked if she then re-
"collected it, and to the astonishment of all
"present she repeated the whole sermon al-
"most in the same words in which it had
"been delivered."

As an appendix to this case may be mentioned that of the very remarkable JEDEDIAH BUXTON, for a full account of whom the reader is referred to the Gentleman's Magazine, for Feb. 1751.

This man was a common labourer, and lived at Elmton, near Chesterfield, in Derbyshire. He had received so little education that he could not write his own name, yet he had cultivated that kind of memory which is necessary

ſary in arithmetic, in a moſt ſurprizing degree, being able to multiply, in his mind, with the greateſt facility, five or ſix cyphers by full as many. He was aſked by a Mr. HALLADAY how many ſquare feet were contained in a field 423 yards long, and 383 broad. In leſs than two minutes he returned the proper anſwer. Upon being aſked how many barley-corns it would take to meaſure eight miles, he anſwered in about one minute and a half, 1,520,640.

Theſe queſtions, however, were eaſy ones in compariſon with others, the ſolution of which ſometimes occupied him a whole week or two.

Many other inſtances of uncommon memory are related by ancient writers. DRUSUS, it is ſaid, could repeat the whole of HOMER; SALLUST knew the whole of DEMOSTHENES; MITHRIDATES could ſpeak twenty-two languages; and CYRUS could name every ſoldier in his immenſe army.

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The difference of memory in different individuals is ſo ſtriking as to be a matter of common obſervation. Some are undoubtedly born with ſuperior powers of this faculty in compariſon with what others are. But in moſt people it may be improved and ſtrengthened to a great degree. There are four cauſes which principally contribute to this:

1ſt. The degree of attention which a perſon gives to ſenſorial impreſſions, as well thoſe which ariſe from external impreſſions, as thoſe which ariſe from the operation of his mental faculties.

2dly. Frequent repetition of the ſame impreſſion.

3dly. The artificial order which we give to our ideas.

4thly. Exerciſing the faculty itſelf frequently.

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This is not the place to enter into a particular inveſtigation of the influence of theſe cauſes, ſince it is evident it belongs more to the curative part than to the natural hiſtory of the faculty.

Having taken a view of the different phenomena of memory in its healthy ſtate, it remains to ſpeak of its pathology, or diſordered ſtate.

Memory may either be morbidly impaired, or it may be aboliſhed. Almoſt all the cauſes which weaken memory are capable, if they continue to exert their influence on the body for a great length of time, or if very powerful, to aboliſh the operations of the faculty, either for a long or ſhort while, according to circumſtances.

Theſe cauſes are either *mental*, or *corporeal*; the *mental* ones are two in number:

1. Habits of inattention.

2. Over-exertion of the faculty itſelf.

The

The *corporeal ones* are

1ſt. Topical, or general derangements of the brain, and cerebellum, as occaſioned by

a. Blows and contuſions.

b. Apoplexy.

c. Palſy.

d. The diſeaſed arterial action, which takes place in various fevers.

e. The diſorganization which occurs in old age.

2dly. Debility, as occaſioned by

a. Certain poiſons.

b. Exceſs of venery, and ſelf-pollution.

c. Stomachic complaints, of various kinds, comprehended under the extenſive titles of dyſpepſia, apepſia, chronic weakneſs, &c.

d. Nervous diſorders, and hyſterical affections of various kinds.

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Of theſe cauſes, the whole of the firſt claſs of corporeal ones are ſo often producing their effect, that there cannot be a perſon of general reading, of moderate obſervation, or a phyſician of any extent of practice, who have not either been a witneſs of their influence, or at leaſt have repeatedly read or heard of it. I ſhall, therefore, not take up time in inſerting a great number of caſes to prove theſe facts, but ſhall confine my obſervations to thoſe which are either not common, or not well underſtood.

Of all kinds of memory, that which is neceſſary for intricate arithmetical calculation is perhaps the one that demands the moſt conſtant and powerful efforts of the faculty itſelf. Many calculators have been known to paſs ſeveral days and nights without ſleep, in conſequence of having been previouſly engaged with the ſolution of ſome intricate queſtion. This is a clear proof that the action of the veſſels which ſupply the brain have been excited to a preternaturally increaſed action; and a ſtronger proof of the ſame kind is, that there

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are cafes related of fuch men becoming delirious from fimilar caufes.

In other cafes it would appear that the great excitement which is produced by an over-ftraining of the faculty, is followed by an exhauftion of the fenforial, or nervous principle, and confequently the mind cannot act on it, and the memory feems to be greatly impaired.

There is a very curious cafe of fudden failure of memory from the too long continued ufe of the faculty. It is mentioned in Vol. VII. of the Pfychological Magazine. It ftates that a man, of rather weak intellects, who held an office, the fole duty of which confifted in figning his own name to a number of papers, had one day fo much bufinefs to do, that he at laft was incapable of recollecting the word he ought to fign. It feemed to him as if he had totally forgotten it. Almoft all his friends difbelieved the affertion; "Yet," fays Mr. Van Goens, (a gentleman of great refpectability, and well known in Germany, who relates the cafe,) "I am apt to think it was not more impoffible

impoſſible or extraordinary than it appeared to be to the perſon himſelf. In juſtification of this remark, he mentions a caſe much more remarkable than the one juſt now taken notice of. He adds, that the truth of the anecdote may be relied on.

" Mr. Von B——, formerly Envoy to
" Madrid, and afterwards to Peterſburgh, a
" man of a ſerious turn of mind, yet by no
" means hypochondriacal, went out one
" morning to pay a number of viſits.

" Among other houſes at which he called,
" there was one where he ſuſpected the ſer-
" vants did not know him, and where he,
" conſequently, was under the neceſſity of giv-
" ing in his name, but this very name he had,
" at that moment, entirely forgotten. Turning
" round immediately to a gentleman who ac-
" companied him, he ſaid, with much earneſt-
" neſs, ' For God's ſake, tell me who I am.'
" The queſtion excited laughter, but as Mr.
" Von B—— inſiſted on being anſwered, add-
" ing that he had intirely forgotten his own

" name, he was told it, upon which he " finiſhed his viſit."

Mr. Van Goens ſays, that the gentleman who accompanied Mr. Von B—— was the perſon who related the fact to him.

Thucydides aſſerts that during the plague which raged at Athens, many who recovered from that dreadful malady loſt their memory ſo completely, that they not only forgot the names of their friends and relations, but alſo their own names.

Several caſes of loſs of memory from fevers of various kinds, will be found in Shenkius, *Obſ. Med.* Lib. I.

In Boerhaave's *Prælectiones Academicæ in Inſtit. Med. ex Edit. Halleri*, Vol. IV. p. 463, we find the caſe of a Spaniſh tragic author related, who had compoſed many excellent pieces, and who in conſequence of an acute fever, ſo completely loſt all memory, that he forgot not only the languages he had formerly learnt,

learnt, but even the alphabet, and was therefore under the neceſſity of beginning his ſtudies again. His own poems and compoſitions were ſhewn to him, but it was impoſſible to convince him that they were of his production. He afterwards, however, began again to compoſe verſes, which had ſo ſtriking a reſemblance to his former writings, that he at laſt became convinced of his having been the author of them.

There is a very ſingular defect of memory, of which I myſelf have ſeen two remarkable inſtances. It ought rather to be conſidered as a defect of that principle, by which ideas, and their proper expreſſions, are aſſociated, than of memory; for it conſiſts in this, that the perſon, although he has a diſtinct notion of what he means to ſay, cannot pronounce the words which ought to characterize his thoughts. The firſt caſe of this kind which occurred to me in practice, was that of an attorney, much reſpected for his integrity and talents, but who had many ſad failings, to which our phyſical nature too often ſubjects

 us.

us. Although nearly in his 70th year, and married to an amiable lady, much younger than himſelf, he kept a miſtreſs whom he was in the habits of viſiting every evening. The arms of Venus are not wielded with impunity at the age of 70. He was ſuddenly ſeized with a great proſtration of ſtrength, giddineſs, forgetfulneſs, inſenſibility to all concerns of life, and every ſymptom of approaching fatuity. His forgetfulneſs was of the kind alluded to. When he wiſhed to aſk for any thing, he conſtantly made uſe of ſome inappropriate term. Inſtead of aſking for a piece of bread, he would probably aſk for his boots; but if theſe were brought, he knew they did not correſpond with the idea he had of the thing he wiſhed to have, and was therefore angry; yet he would ſtill demand ſome of his boots, or ſhoes, meaning bread. If he wanted a tumbler to drink out of, it was a thouſand to one he did not call for a certain chamber utenſil; and if it was the ſaid utenſil he wanted, he would call it a tumbler, or a diſh. He evidently was conſcious that he pronounced wrong words, for when the proper expreſſions were

were ſpoken by another perſon, and he was aſked if it was not ſuch a thing he wanted, he always ſeemed aware of his miſtake, and corrected himſelf by adopting the appropriate expreſſion. This gentleman was cured of his complaint by large doſes of valerian, and other proper medicines.

For ſome time I conſidered this as a very rare caſe; but a few years afterwards I met with another, which came on in conſequence of a paralytic affection; and other inſtances of it are to be met wtth in the writings of different medical men. In Vol. VII. of the Pſychological Magazine, profeſſor GRUNER, of Jena, relates the hiſtory of a learned friend of his, whoſe memory was affected in a manner very ſimilar to that which has been mentioned. "After his recovery from an acute fever, one "of the firſt things he deſired to have was "coffee, (*kaffee*) but inſtead of pronouncing "the letter *f*, he ſubſtituted in its place a z, "and, therefore, aſked for a cat, (*kazze.*) "In every word which had an *f* he committed "a ſimilar miſtake, ſubſtituting a z for it.

Mr. VAN

Mr. VAN GOENS, whoſe name has already been mentioned in this chapter, ſays, that the wife of Mr. HENNERT, profeſſor of Mathematics, at Utrecht, who, like her huſband, was alſo a mathematician, and aſtronomer, was affected with a defect of memory, nearly allied to that of the attorney already mentioned.

When ſhe wiſhed to aſk for a chair, ſhe aſked for a table, and when ſhe wanted a book, ſhe demanded a glaſs. But what was ſingular in her caſe, was, that when the proper expreſſion of her thought was mentioned to her, ſhe could not pronounce it.

She was angry if people brought her the thing ſhe had named, inſtead of the thing ſhe deſired. Sometimes ſhe herſelf diſcovered that ſhe had given a wrong name to her thoughts. This complaint continued ſeveral months, after which ſhe gradually recovered the right uſe of her recollection. It was only in this particular point that her memory ſeemed to be defective, for Mr. VAN GOENS aſſures us that ſhe conducted her houſhold matters with

with as much regularity as ſhe ever had done, and that ſhe uſed to ſhew her huſband the ſituation of the heavens on a map, with as much accuracy as when ſhe was in perfect health. *Pſychol. Mag.* Vol. VII. part 3, page 73.

The following caſe may alſo be conſidered as a modification of the ſame complaint.

" A man, aged 70, was ſeized about the
" beginning of January, with a kind of cramp
" in the muſcles of the mouth, accompanied
" with a ſenſe of tickling all over the ſurface
" of the body, as if ants were creeping on it.
" On the 20th of the ſame month, after hav-
" ing experienced an attack of giddineſs, and
" confuſion of ideas, a remarkable alteration
" in his ſpeech was obſerved to have taken
" place. He articulated eaſily and fluently,
" but made uſe of ſtrange words which no-
" body underſtood. The number of theſe
" does not at preſent ſeem to be great, but
" they are frequently repeated. Some of
" them he ſeems to forget intirely, and then
" new ones are formed. When he ſpeaks
" quick,

"quick, he ſometimes pronounces numbers, "and now and then he employs common "words in their proper ſenſe. He is con-"ſcious that he ſpeaks nonſenſe. What he "writes is equally faulty with what he ſpeaks. "He cannot write his name. The words he "writes are thoſe he ſpeaks, and they are al-"ways written conformably to his manner of "pronouncing them. He cannot read, and "yet many external objects ſeem to awaken in "him the idea of their preſence." GESNER'S *Entdeckungen der neueſten Zeit in der Arzneigelahrheit.*

That great debility of body is a very common cauſe of a weak memory, every practitioner in phyſic muſt be convinced. The moſt ruinous kind, however, in its conſequences, in regard to the mind, is the odious and baneful practice of onaniſm. This I have often known carried to ſuch exceſs, in both ſexes, as not only to bring on every ſymptom of atrophy, but almoſt to deſtroy every active operation of the human underſtanding. The memory is, of all the faculties, the one which ſuffers

ſuffers firſt, and in the higheſt degree; and it unfortunately happens, that when it has once been much weakened by ſuch a cauſe, it is ſeldom ever perfectly recovered afterwards. Tissot has already taken notice of the fact in his treatiſe on that vice, and has dwelt largely on it. To that book, therefore, the reader is referred, if he is deſirous of having further information on the ſubject.

Bonetus mentions a caſe of a very great defect of memory, occaſioned by that debility which accompanies the ſuppreſſion of a certain periodical diſcharge in women. *Medicin. Septent.* Lib. I. Sec. ix. cap. 2.

In Wepfer's *Obſerv. Medico Practicæ*, Obſ. 99. there is mentioned the caſe of a man of great note, who reſided in the ſame city in which Wepfer lived. This gentleman loſt his memory for a conſiderable time, in conſequence of a profuſe hæmorrhage. Various other caſes of a ſimilar nature are to be met with in the ſame work, and alſo in the *Medic. Septent.* of Bonetus.

It

It would be an eaſy matter to amplify this ſubject by the enumeration of more caſes of defective memory which ariſe from cauſes ſimilar to thoſe that have been mentioned. But enough has been ſaid on the ſubject.

It remains for us to turn our attention to the aſſociation of ideas, and obſerve what ſtrange aberrations of mind, at times, ariſe from it. "The power of aſſociating our "ideas," ſays the celebrated Abbé CONDILLAC, "has its inconveniences, as well as its "advantages. To prove this, I ſuppoſe two "men, one of whom has never been capable "of connecting his ideas, and the other who "connects them with ſo much facility and "force that they become inſeparable. The "firſt cannot have any imagination, or memory, and conſequently cannot exerciſe any "of the faculties of his mind, which depend "on one or other of theſe. He is abſolutely "incapable of reflection, and, in one word, is "a mere idiot, (un imbecille). The ſecond, "on the contrary, muſt neceſſarily be endowed

"with

" with too much imagination, and memory; " and this excefs is capable of producing full " as bad effects as the entire privation of them. " He would be incapable of reflection, and " be abfolutely a madman. *Il avroit à peine " l'exercife de fa reflexion; ce feroit un fou.* The " ideas the moft diffimilar being ftrongly con- " nected in his mind, merely becaufe they " were prefented at the fame time, he would " conceive them naturally allied to each other, " and would make the one follow the other " as a confequence follows the caufe."

Between thefe extremes, he adds, there may be fuppofed to be a juft medium. This is a point of fuch difficult difcovery, that the greateft geniufes feldom find it out. Accordingly as they approach the one extremity or the other, they naturally retire from it. " Thofe " who have too much memory, and imagina- " tion, are deficient in many qualities which " are neceffary to a methodical, accurate, and " folid underftanding. Thofe who deviate " in an oppofite direction, lofe all the quali-

" ties

" ties which give charms to wit. The firſt " claſs write with moſt grace; the ſecond " with moſt depth."

Were the train of ideas to be followed which this obſervation of CONDILLAC's gives riſe to, an inveſtigation of a moſt intereſting nature might be inſtituted, concerning the influence of this principle in all kinds of compoſition, whether in poetry, or in proſe, in wit, or in learning, or in the arts, and in ſcience. But as the facts belonging to the natural hiſtory of the human intellects, which are to be brought forward in this work, muſt be ſolely directed to the elucidation of its morbid hiſtory, or pathology, this inticing tract of inquiry muſt be abandoned, and our eyes turned to a more melancholy, though, perhaps, more uſeful expoſition of mental phenomena.

There is a ſpecies of inſanity of ſo ſurprizing a kind, that nothing but its frequency prevents us from regarding it with that aſtoniſhment which it is well calculated to excite: a perſon

a perſon conducts himſelf like a man of ſenſe, in every reſpect except in one particular circumſtance; but in that, his thoughts and actions are in ſuch oppoſition to thoſe of other men, that he appears to them to be evidently deranged. This is the *melancholia moria* of SAUVAGES. In many caſes it is a ſpecies of hypochondriaſis, ariſing from corporeal cauſes, as for inſtance, when a perſon erroneouſly believes any part of his frame to be altered from its natural form; but in other caſes it ariſes from mental cauſes. The judgment is generally naturally weak, or preternaturally debilitated by various circumſtances, and then certain predominant affections and paſſions give birth to the diſeaſed aſſociations; as when a perſon believes he is endowed with a prophetic ſpirit; that he is the intimate companion of kings and princes; that he aſcends up to heaven, or deſcends to hell, &c.

As the inſane idea of ſuch people generally conſiſts of certain combinations of thought, which experience does not yield, but are formed in the mind, either by diſeaſed feelings,

or

or ſtrong paſſions and deſires, this malady appears to belong rather to the ſubject of imagination, than to this place; and as the hiſtory of its riſe and progreſs cannot be fully conſidered until the nature of that faculty has been explained, we ſhall defer ſpeaking of it till then.

Although we are indebted to the principle of aſſociation of ideas for all the benefits of knowledge and genius, yet it often becomes the ſource of much miſery and diſtreſs, as well as of many falſe judgments, which, although not commonly conſidered as deliria, are no leſs aberrations from ſound ſenſe. When any accident or calamity happens to us, ſo as to excite ſome ſtrong paſſion, every thing which afterwards brings it ſuddenly to our recollection, occaſions nearly the ſame powerful emotions as happened at firſt. Suppoſe a perſon to have been much frightened, and hurt by ſome fierce animal, the ſight of a ſimilar one occurring at any period of life afterwards, will often excite violent alarm in the mind, even although the

animal

animal ſhould be tame and ſecured. If the ſight of a diſagreeable, or diſguſting object, has made the ſtomach revolt, ſo as to induce nauſea and vomiting, the mentioning the name of the object at any time afterwards, will do the ſame thing. The antipathies and averſions which many people have for certain things, can only be explained on this principle. Of thoſe who eſcaped from the earthquake at Liſbon, I formerly knew one gentleman, who, if he accidentally heard the word earthquake mentioned in company, became almoſt inſtantaneouſly delirious. Boileau, when a child, happened one day, when he was at play, to irritate a turkey-cock, to a prodigious degree. He accidentally fell backwards, and the enraged animal flew at him, and wounded him in ſuch a delicate part, and in ſo ruinous a manner, as rendered him incapable of ever afterwards enjoying the advantages peculiar to his ſex. Weickard, and ſeveral others, who mention this circumſtance, aſcribe to it the hatred which the poet afterwards ſhewed to women, and all who admired them; and

and to the Jeſuits, who were ſuppoſed to be the firſt who introduced the Turkey fowl into Europe. *Philoſophiſche Arzt.* B. I. bl. 7.

Upon the ſame principle, many aſſociated ideas which are peculiar to certain countries, and which give riſe to a number of uſages and cuſtoms that appear unreaſonable and cruel, and even barbarous to others, may be conſidered as national veſaniæ. Of this kind is the aſſociation of ideas which was taught the Romans, that it was much nobler to put a voluntary end to their exiſtence than to outlive a diſgrace; of this kind is the aſſociated ideas inſtilled into the tender mind of the female Hindoo, who believes that a voluntary ſacrifice of her life, upon the death of her huſband, is an infallible means of ſecuring to herſelf everlaſting happineſs; and the prevailing opinion among the men of the more civilized parts of Europe, that no reparation for certain inſults can be otherwiſe procured than at the hazard of one's life, is of the ſame nature.

It

It muſt be evident to every perſon of reflection, that to follow this chain of thought would naturally lead to the examination of certain maxims and principles, derived from different forms of political and church government. But it muſt alſo appear that a proper boundary is here put to the reſearches of the author.

CHAPTER V.

ON JUDGMENT, AND ITS DEFECTS.

Claſſification of human judgments. Inquiry into the nature of judgment. Reaſon, what it is. In what degree brutes poſſeſs it. What things are to be conſidered as acts of judgment. A man is not mad becauſe he thinks differently from the reſt of mankind. Whether judgment is ever deranged in a madman. Of judgments as to future events. A ſpecies of curious prediction accounted for. Of the defects of judgment; claſſification of their cauſes. Erroneous judgments, to what they are to be referred.

THE common appellation given to this faculty is a term extremely proper, as far as it regards the mere reſult of the mental operations; ſince the examination of various perceptions, or ſubjects of thought, preſented to the mind for the exerciſe of this faculty, always

ways terminates in a conclufion, or judgment, (*judicium*).

Few authors have treated fully of this faculty; and of thofe who have done fo, not any one whofe works have fallen into my hands, have taken it up as a mere object of natural hiftory. They have defined it, and difcuffed fomething concerning its properties, in a very metaphyfical way; but their definitions are generally faulty, and incorrect, and their fpeculations too refined for the phyfiologift. Inftead of attempting to explain, at prefent, the nature of judgment, let us confine ourfelves to the tafk of difcovering and examining the various claffes of ideas, which man, in found mental health, is capable of comparing with one another. By this means we fhall be enabled to find out what the intellectual character is which is common to them all.

1ft. External objects, that is to fay, the perceptions they excite, may be compared with each other, as, for inftance, when a perfon is

desired to say which of any number of men appears to be the strongest, or tallest, or oldest, &c.

2dly. External bodies, and qualities of bodies, may be compared with certain pre-existing judgments and opinions, as in many matters of knowledge and taste; for instance, when a person is desired to give his opinion about a piece of architecture, a picture, a landscape, or a horse; in which case he compares the object before his eyes with the notions he has already acquired concerning the things to which it relates.

3dly. Abstract qualities, and prior judgments may be compared with each other, as, for instance, when ROUSSEAU decides that that which is commonly called civilization, and culture, do not promote the general happiness of mankind; and

Lastly, The comparison may take place between all those things already mentioned, and the conclusion, therefore, or judgment, has a relationship to the whole of them, as

as is the caſe when a judge has to give an opinion in certain complicated caſes of right or wrong, from a multiplicity of dead and living witneſſes, and from the relationſhip which the reſult of their teſtimony has with former deciſions, and the exiſting laws; or when a phyſician is deſired to form an opinion as to the probable event of a dangerous diſeaſe, in which caſe not only all the phenomena preſent are to be duly weighed, and their cauſes conſidered, but theſe things muſt alſo be compared with the knowledge he has acquired concerning the various cauſes and appearance of death, and with the probable effect which he expects from the means he employs to oppoſe that event.

It is a curious, and certainly an obſcure queſtion, how the human mind ſhould be able to compare the relationſhip of any two or more circumſtances, ſince one ſubject of thought alone occupies our attention at one and the ſame moment of time. For if this be a fixed law of the human mind, (which, indeed, all the phenomena of thought tend to confirm) then

then as ſoon as any one circumſtance to be compared, has been ſucceeded by another, there ought to be no further perception of the qualities of the firſt one; but how is it poſſible to compare the preſent thought with the one which preceded it, if we have no perception of its qualities?

Every queſtion demanding an act of judgment for its ſolution, requires not only the examination of the facts ſtated in it, but in every caſe it exacts a compariſon of theſe facts with a certain pre-exiſting notion, which, although not expreſſed in the queſtion, is always included in it. Let us take one of the moſt ſimple acts of compariſon of perception to illuſtrate this poſition. Suppoſe a perſon is aſked which of any number of men he would judge to be the heavieſt. It is evident that in ſuch a caſe the perſon muſt not only compare the men with each other, but alſo with the abſtract notions which he has formed concerning the cauſes of weight. When a perſon is deſired to ſay which of two horſes he judges is the fleeteſt; the perſon compares the peculiar form

form of each horſe with the abſtract notion he has already acquired of the make which a very fleet horſe ought to have; and the horſe which has the ſtrongeſt relationſhip or ſimilarity with that pre-exiſting thought is judged by him to be the ſwifteſt. In doing this, the perſon is conſcious that the objects, or thoughts to be examined, have different degrees of reſemblance, or analogy with the abſtract notion, and conſequently he muſt be conſcious that they have different degrees of diſſimilarity among themſelves. The judgment which he delivers is nothing elſe than an enunciation of this relationſhip. A judgment, therefore, is nothing elſe than a perception of the ſimilarity, or diſſimilarity of two or more ideas.

The mere proceſs of comparing ideas is called judgment, and the faculty we are poſſeſſed of, which enables us to draw general concluſions from any number of compariſons, is commonly called reaſon. The analogy which exiſts between the two is obvious.

This

This operation of mind is ſuppoſed to be peculiar to man, exalting him above all other created beings, becoming the ſource and ſupport of his grandeur when duly exerciſed and cultivated, and the ſtandard of his debaſement when neglected, or ſubjugated by vice and paſſion.

Other animals as well as man have the power of comparing perceptions and thoughts, as is evident from their actions, which are often the reſult of ſuch an examination; but there is every reaſon to believe that in them it is only exerciſed in regard to external and particular objects, and that they are incapable of forming any logical or general concluſions, or any abſtract notions.

As reaſon is the faculty by which we deduce certain concluſions from the compariſon of our ideas, it is evident what thoſe things are which deſerve to be conſidered as acts of this faculty. Theſe are the inveſtigation of truths, (taking it for granted that truth is to be found) the generalizing ideas, the rectification and

proper

proper application of language; the application of general ideas (principles) to the improvement of ſcience, or the regulating our own conduct, as ſtandards by which the conduct of others is to be judged, the checking our paſſions, &c.; all theſe things are properly conſidered by mankind at large, as acts of reaſon; and when a man is deficient in any of them, he is ſaid to think or act unreaſonably, or to evince a want of ſolid underſtanding. It does not follow, however, that becauſe a perſon thinks and acts differently, on a few points, from the majority of the world, that ſuch a perſon acts unreaſonably, or injudiciouſly; for the principles which regulate his judgment, although different from thoſe of other men, may be more correct than theirs, and when made known may command general aſſent.

The judgments we have formed from paſt events conſtitute a great part of our experience; and as theſe have unfortunately not always been correct, they often act as cauſes which miſlead us in our judgment of preſent

and

and future events. The judgments we form as to the probable iſſue of diſtant events, has been conſidered by many as a diſtinct faculty, called the *faculty of foreſight*, or *prediction*. As the ſubject is naturally allied to that which we have analyzed, it may be expected that it alſo ſhould be ſubjected to examination.

All men poſſeſs this faculty in a certain degree; every man foretels that the ſun will riſe to-morrow, that the night will follow day. An experienced ſeaman foretels a change of weather, long before it happens; a wiſe and unimpaſſioned ſtateſman can foreſee the convulſions that will happen in ſtates which are in apparent tranquillity, vigour, and power.

Although the laſt mentioned circumſtances ſeem to be the effect of a prophetic ſpirit, when compared with the firſt, yet they both depend on the ſame principle. We have ſeen the ſun ſet often, and regularly riſe ſometime afterwards; when, therefore, we ſee the ſun ſet again, we judge it will again ariſe; we have no moral certainty that the event will

take

take place, we only judge that it will do ſo, becauſe we have often ſeen the ſame thing happen. The ſailor who foretels a diſtant change of weather, does ſo becauſe he has often ſeen ſuch a change of weather preceded by the appearances which cauſed him to form this concluſion in his mind. The ruin of an empire is foretold in the ſame manner, but the prediction ſeems wonderful to the ignorant, becauſe the facts on which the judgment is founded are not always evident to the multitude. They are to be ſought for in the deep receſſes, and records of ancient as well as modern times, in the ſpirit of the laws, in the temper of the rulers, and the diſpoſition of the ruled.

The theory of ſuch predictions as theſe is ſo clear as not to require any further elucidation. The perſon who predicts ſuch, events can always trace the circumſtances which have led him to ſuch a concluſion; but there are others, for which, however habituated he may be to reflect on the operations of his own mind, he can ſeldom give a ſatisfactory account.

count. One of the moſt common of theſe kinds of foreſight is that wonderful preſentiment which cauſes many men to announce their death, a conſiderable time previous to its taking place. No alluſion is, at preſent, made to any preternatural warnings; of this, probably, hereafter. A perſon labouring under a mortal diſeaſe, and from whom the danger is carefully concealed, ſhall ſay to his phyſician "Sir! all your endeavours are in vain. I feel "that I ſhall ſurely die of this complaint." The event is fulfilled in a few days afterwards.

The expreſſion which the perſon employs evidently points out the proper mode of analyzing this kind of judgment, ſo as to arrive at the principles on which it is founded.

It has been remarked, that there are two very different claſſes of perceptions, the one diſtinct and clear, yielding us what we believe to be accurate repreſentations of the objects from which they flow. The other is obſcure, and gives us no kind of knowledge of the cauſes which produce the perceptions in our mind.

mind. The firſt is received from external objects, acting on our external ſenſes; the ſecond is derived from impreſſions on the extremities of all the other nerves of the body, particularly thoſe of the viſcera, of the abdomen, and thorax. When treating of theſe ſubjects, the reaſons were pointed out why impreſſions on the remote extremities of ſuch nerves did not give a clear perception to the mind, and the ultimate end that was obtained by ſuch a wiſe œconomy, was alſo hinted at.

The uſual and ordinary impreſſions which are conſtantly taking place on the extremities of the nerves of the thorax, and abdomen, and all the other parts of our frame, except the external ſenſes, do not, as has been already obſerved, produce any mental perception ſufficient to engage our attention while the animal is in perfect health. No healthy perſon feels the food in his ſtomach, or the matters contained in his inteſtines, the blood which circulates through the whole of his body, or the gall in his gall-bladder, &c. But as ſoon as any organ, or ſet of organs, is deranged,

ranged, or the matters which ought to be applied to it, are much altered, then ſenſations ariſe which perhaps engage our attention the more ſtrongly, inaſmuch as from their obſcurity we are always in doubt from what cauſe they proceed, or how they are to terminate. Many of theſe we have been accuſtomed to from our infancy, ſuch as various kinds of pains and uneaſineſſes, ſenſations of weakneſs, increaſed heat, thirſt, loſs of appetite, quickened reſpiration, &c. Theſe, except they happen to be in a very unuſual degree, ſeldom awaken our fears, for the perſon truſting to his paſt experience, hopes they will again terminate in a return of health; but when any new ſenſation is felt, which affects us in a very uncommon manner, apprehenſion inſtantly ariſes in the human mind. Suppoſe a blood-veſſel to give way in ſome internal part, as in the cavity of the abdomen: the perſon without being conſcious of what has really happened, is at once alarmed by the uncommonneſs of the ſenſation, and when he finds this to be quickly ſucceeded by a dimneſs of ſight, and ſudden loſs of his ſtrength, his terrors inſtantly

ſtantly increaſe to the greateſt poſſible degree. He in vain calls in the aſſiſtance of experience, and recollection, in order to judge what may happen; and the ideas the moſt naturally aſſociated with his fears, therefore, preſent themſelves involuntarily to his imagination. Now the moſt alarming of all ideas which men in general have formed to themſelves, is that of their own diſſolution; and as they know this is generally preceded by diſeaſed feelings, the gradual ſinking of their ſtrength naturally excites this thought, and they announce their death.

The prediction of death naturally ariſes from the abſence of thoſe feelings which would lead us to expect a return of health. Three ſets of cauſes particularly excite this alarm; a conſciouſneſs, or feeling of an uncommon and increaſing proſtration of ſtrength; vertigo, and its attendant, loſs of ſight; and, thirdly, whatever greatly impedes reſpiration. In almoſt every diſeaſe in which patients have predicted their own death, one or other of theſe ſymptoms occur. That their judgment is often

often erroneous, need not be mentioned; but as it has been looked upon with wonder, when the fact has coincided with the prediction, I thought it might not be uninterefting to place the phenomenon in its proper light. To return to our fubject.

Between clear and unclouded reafon, and abfolute infanity, there are many fhades of greater or lefs deviation. To enumerate, or point out the diftinction which exifts between them is impoffible. Language is not fufficiently copious and accurate to afford fuch a means. The caufes of thefe deviations are numerous, and the whole fubject, therefore, although very important to be known, is of difficult inveftigation.

In regard to the practice of phyfic, the diftinctions which exift between the defect of judgment, or reafon, are of much lefs confequence than their relation to the moral world, or their influence on fociety; for judgment, confidered as a faculty, has no peculiar difeafe. The conclufions which a perfon forms

in

in his mind, may be erroneous, but the faculty of judging is the ſame in a madman, as in a man in perfect health. One would not ſay that a muſician of Nootka Sound, or the South Sea iſlands, was leſs ſane than an able and accompliſhed muſician of this country, becauſe he produced different combinations of ſound. The muſcles in the hands and arms, and the faculty of moving them, may be equally healthy in both. So it is in regard to lunatics, and men who are of ſound mind. The faculty of judging is the ſame in both, but they have different perceptions, and their judgments, therefore, muſt be different. The madman has diſeaſed nerves and brain, and diſeaſed perceptions, and he is therefore obliged to draw concluſions which appear ſtrange to a man in health. If a madman judges that he has the government of the whole world in his hands, and that the ſeaſons are obedient to his command; that he can dry up the waters of the Ganges by a wiſh, or thaw the continents of ice which ſurround the poles; if he believes that he can make the produce of Italy ſpring up in the deſerts of Arabia, or the climate of Arcadia

reign in Great Britain, he *judges* in this way becaufe the perceptions which are prefent in his mind force him to draw fuch conclufions. The procefs of his intellectual faculties in this cafe, is equally correct as that which caufed Sir Isaac Newton to conclude from a number of facts that all bodies gravitate towards each other, for the intellectual part is the fame in both, but the brain is difeafed in the lunatic.

It is, doubtlefs, a true character of infanity when a man's judgment is under the influence of difeafed perceptions, fo that he cannot judge as the generality of men do. It would be a very injudicious application of philofophy, were a perfon in converfation to try to prove that a madman was not mad becaufe he judged correctly about the objects of his thoughts.

The defects of judgment do not arife, then, from any fault in the faculty itfelf, but from the materials on which that faculty has to operate.

The deviations which thefe materials occafion are of two kinds:

1ſt. Incorrect judgments.

2dly. Erroneous judgments.

Incorrect judgments may ariſe,

A. From a want of ſufficient facts, or materials.

B. From a too haſty examination of one or any number of them.

C. From not *recollecting* all the chain of analogies, or the different links of relation, by which the various parts of evidence, or facts, are connected with the general concluſion.

D. From the interference of matters of belief, prepoſſeſſions, prejudices, or paſſions.

1ſt. Every perſon, even of the ſoundeſt mind, is liable to incorrect judgment if he ſpeaks on a ſubject with which he is not ſufficiently acquainted, or if he attempt to give an opinion on a point which requires for its deciſion more facts than are laid before him;

 for

for it is evident that the judgment in ſuch caſes is founded on a partial view of the ſubject, and many facts which are not examined may ſtand in oppoſition to the general concluſion, or judgment he forms. It is unneceſſary to expatiate on this.

2dly. A too haſty examination of any number of facts, on which a queſtion hinges, produces nearly the ſame effect as a want of ſufficient evidence. The mind of every perſon requires to be habituated to dwell for a certain length of time on each fact which has any relation to the queſtion, and which is conſequently of uſe in forming a judgment. This habit is to be gained, in moſt caſes, by education. The command of our thoughts muſt be obtained by habitual reſtraint, and coercion, in early life, if it be required that a perſon ſhould excel in correct judgment. In many caſes this is a trial of uncommon difficulty, both for the inſtructor and the inſtructed. There is a certain irritability of mind, if I may be allowed the expreſſion, which it is hardly poſſible to reſtrain by common means;

and,

and, unfortunately, the generality of parents, and of thoſe intruſted with the education of youth, are ſeldom ſufficiently acquainted with the varieties of mental character to diſcover this temperament when it prevails. It is moſt ſtrong in thoſe who have a mixture of the ſanguine and choleric diſpoſition. Thoſe who are purely ſanguineous, although they have it in a leſs degree than the former, are ſtill very much under its influence; young people, when compared with thoſe of a mature age, and women, when compared with men, may be ſaid to be of the ſanguine temperament; and hence people who have a mixture of the ſanguine and choleric diſpoſition, thoſe of a purely ſanguine temperament, and women and young people, are much more liable than the reſt of the world to incorrect judgment.

3dly. It muſt be evident that judgment depends greatly on the goodneſs of memory. A perſon who forgets the *data* of any ſcience, is conſtantly expoſed to form incorrect concluſions concerning thoſe parts of it which have any relation to the *data* which are forgotten.

The

The neceſſity of a correct memory, in regard to judgment, cannot be better proved than by the obligation impoſed on the judges of this country. In ſumming up evidence, in any cauſe, they are not permitted to truſt to their memory alone. They muſt write down the facts which they draw from the witneſſes, and which they are afterwards to recapitulate to the jury.

4thly. Among the frequent cauſes of incorrect judgment, the prepoſſeſſions, prejudices, and paſſions of men, are to be enumerated; for, in ſuch caſes, the various facts will be examined as much by their relation to the various deſires and averſions which predominate in the mind, as by their relation to the general queſtion. If a judge is prejudiced by political opinions in favour of certain uſages, it will not be an eaſy matter for him to preſerve himſelf pure in the court when caſes come before him which regard ſuch uſages. He will prefer the bye-law of a corporation to the expreſs ſtatute of government, if it happens to coincide with his deſires.

"Omnis

" Omnis homines qui de rebus dubiis con-
" ſultant ab odio, amicitia, ira, et miſericor-
" dia vacuos eſſe decet. Haud facile animus
" verum providet, ubi illa officiunt, neque
" quiſquam omnium lubidini ſimul et uſui
" paruit. Ubi intenderis ingenium, valet; ſi
" lubido poſſidet, ea dominatur, animus nihil
" valet." *Tiberii Orat. ap.* SALLUST *de Conjuratione* CATILINÆ.

Erroneous judgments ariſe from diſeaſes of the external ſenſes, from diſeaſes of the body, preventing the due agency of external objects; from the cauſes which derange attention, mental perception, and memory; and the faculty we poſſeſs of abſtracting and compounding thoughts. They are therefore to be ſought for in the preceding and ſucceeding chapters of this work.

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